AIR CONDITIONING HEATING & REFRIGERATION NEWS

The Newspaper of the Industry

RESIDENTIAL — COMMERCIAL — INDUSTRIAL

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Inside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

All-Star Game Tomorrow!
Rye on the Rocks
What's the Use of Kids?
Like Grandfather Said
Midnight Revelations
Hoot's Heroism

All-Star Game Tomorrow!

Any major league baseball team could use a man who plays every position superbly, never strikes out, and seldom makes an error.

But there's no method known to make him lay down his hot dog, come out of the grandstand, and make good his boasts and challenges.

Nevertheless, non-playing Baseball FANS maintain and support our National Pastime and Institution, especially on a day like tomorrow.

Following anecdotes are dedicated to subscribers (and there are many thousands, we've learned) who worship baseball.

Tomorrow, July 7, we'll all watch the All-Star Game—on television, at least.

Rye on the Rocks

Ever hear of Gene Rye? Probably not. Yet, the poorly publicized Rye was instrumental in establishing a staggering set of records.

What he did happened in the Texas League on the night of Aug. 6, 1930. Waco (Gene's team) met up with Beaumont.

Rye led off in the eighth inning, and hit the second pitch over the rightfield fence. A walk, a single, and another walk filled the bases, and brought in another pitcher. This fellow could not get anybody out, and was relieved.

First batter who faced the new boy was Rye. Two of Rye's teammates were waiting to be driven home. Rye accommodated them by hitting his second home run of the inning over the rightfield fence.

Waco batted around, and Rye came up again, this time with the bases packed. Boom! A third homer. In the press box savants thumbed through record books. They found he had established the following marks:

Most home runs in one inning—3.

Most extra-base hits in one inning—3.

Most total bases in one inning—12.

Most runs batted in one inning—8.

He also tied a few records, namely:

(Concluded on Page 10, Col. 1)

3 Utilities Cut Electric Winter Rates

DETROIT — Favorable rates for electrical heating customers were announced recently by utilities in Houston, Hartford, Conn., and Detroit.

A special one cent per kilowatt hour winter rate for residential customers was part of a new residential electric service rate recently approved by the Houston city council. The rate eliminates residential demand meter billing and places all energy charges on a strictly kilowatt hour basis, according to Houston Lighting & Power Co.

The special winter rate will be effective during the months of November through April of each year. It reduces the lowest step of the normal rate to one cent per kwh. for all usage over 900 kwh. per month (approximately a $16 bill).

This unprecedented reduction in the winter rate brings the use of electric heating appliances, including built-in and portable resistance heaters, and

(Concluded on Page 25, Col. 4)

Silver Seeks To Sell Sutton Line

WICHITA, Kan. — The iron and steel scrap broker who purchased the "Vornado" line of central air conditioning equipment does not plan to produce it.

Instead, R. M. Silver of L. Silver & Sons here told the NEWS that he is looking for a manufacturer who would purchase the line and continue its manufacture.

As reported in last week's NEWS, Silver obtained the line, one of five that O. A. Sutton Corp. put up for sale, at auction last month.

"To date we have had several

(Concluded on Page 25, Col. 1)

Cross Named Executive Secretary

Growth, Progress Cited by ASHRAE

Robert C. Cross has been appointed executive secretary of the American Society of Heating, Refrigerating & Air-Conditioning Engineers (ASHRAE), it has been announced by Arthur J. Hess, newly-elected president of the society, following the close of the recent annual meeting.

Cross succeeds Aubry V. Hutchinson, who becomes executive secretary emeritus. Cross had been executive secretary of the ASRE from 1954 to the time of its merger with ASHAE in February.

LAKE PLACID, N. Y.—The first annual meeting of the American Society of Heating, Refrigerating & Air-Conditioning Engineers is now history, and it can be recorded that so far as a rank-and-file member could observe, it was a successful meeting, well-attended, and without any of the conflict that some expected through the merger of ASHAE and ASRE.

"Membership is continuing to grow, in the face of some predictions that it wouldn't," said retiring president Cecil Boling, who closed out his six months' term of office (under the setup provided by the merger agreement) at this meeting.

"New membership applications have been coming in at the rate of 175 per month for the past couple of months, and there is every indication that there is increased interest in membership in the society."

Boling said that it had been most gratifying to him since the merger had gone into effect to find that many who had been most strenuously opposed to it, were now working the hardest to achieve the aims set up by the new society.

Not enough time has elapsed since ASHRAE formally came into being (February of this year) to permit any evaluation of the objectives set forth in the merger plans. From informal discussions at Lake Placid, it would seem that the society's own research activities will probably receive the maximum attention among the society's projects.

Those among the refrigerating engineers who feared that the merger might "submerge" their interests to the numerically large group in the ASHAE should have found their fears allayed at this meeting. The preponderance of the papers given at the technical sessions and conferences were concerned with cooling, and of the some 700 in attendance the majority seemed to represent interests concerned primarily with some form of cooling. This may have come about in part, however, from the fact that the Lake Placid meeting was originally scheduled (before the merger) as an ASRE meeting.

Arthur J. Hess of Los Angeles took office as president of

(Continued on Page 5, Col. 1)

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Bus Firm Finds Cooling Dramatic, Economical Way To Modernize

ST. LOUIS—"Air conditioning is one of the most dramatic and economical ways to modernize a transit fleet," affirms the St. Louis Public Service Co.

The transit firm is now operating 245 air conditioned buses. This, it claims, is the largest number of city transit buses so equipped in the world.

Over its two years' experience in operating air conditioned buses, the transit company has found that air conditioned lines produce a 16.4% average daily increase in revenue during the summer months. In addition, a 10% daily increase in revenue is maintained throughout the remainder of the year.

Based on the experience of the last two summers, company records show that air conditioning has produced an average increase of 12% in new transit customers on lines so equipped. This is in addition to the increase realized from local service passengers who have switched to premium-fare air conditioned express service.

With 105 additional air conditioned buses this year, the transit line is using them on all 18 rush-hour express lines, all regular bus lines terminating downtown during midday shopping hours, all special service lines, all downtown bus lines on Saturdays, and all major lines on Sunday.

An Open Letter To The Industry

Acme Industries, Inc.
Jackson, Michigan

Editor:

I'm fed up with our industry. If price is all we have to offer, we are all lost. You cannot sell price, you can only offer a price. Yet, today it seems that that is the only thing that seems to decide anything.

Profits are a direct result of pricing, as you pointed out in your June 22 editorial. Today, we hear manufacturers, consultants, contractors and salesmen, the AC&R industry in general complaining. Serious considerations are being given to greener pastures and getting out of the business entirely.

You have heard the contractor who says that if you

(Concluded on Page 21, Col. 1)

5½ Million Homes Have Some Cooling, Carrier Study Finds

SYRACUSE, N. Y. — More than 5½ million American homes now have some form of summer air conditioning — an increase of three quarters of a million during the past year, Carrier Corp. reported.

According to a survey by Carrier, Texas, New York, and Washington, D. C. are the "big three," with one of every four completely or partially air conditioned homes located inside their borders.

"Texas leads in total households equipped with room or central air conditioning with more than a half million," it was stated. "Washington, D. C. has the highest percentage. More than one-third of the

(Concluded on Page 25, Col. 3)

What Is It?

See Picture on Page 4

Air Conditioned Dairy Shelters

They May Be Profitable Under Certain Conditions, U. S. Department of Agriculture Reports

ITHACA, N. Y.—Air conditioned dairy shelters may be profitable under certain conditions, a U. S. Dept. of Agriculture engineer told the 52nd annual meeting of the American Society of Agricultural Engineers.

Robert G. Yeck of USDA's Agricultural Research Service, speaking here, said air conditioning might be profitable under certain combinations of conditions such as:

(1) average daily production from each cow in a herd of 40 pounds of milk; (2) selling price of milk of at least $6 per hundredweight; and (3) daily temperature above 80° F. and relative humidity above 65% for 60 or more days each year.

This could serve as a guide to dairymen who are considering the advisability of air conditioning their dairy barns, Yeck said. He discussed the results of research at Columbia, Mo., in cooperation with Dr. Milton D. Shanklin of ARS, and Dr. Robert E. Stewart of the Missouri Agricultural Experiment Station.

In their laboratory studies, as temperatures increased above 75° F., milk production dropped 10% at 80° and 35% at 90°. The relative humidity was 65% or above. The cows were exposed to the high temperatures for one to two weeks.

Costs that must be considered include the installation and resulting fixed annual costs for the new equipment, insulation of the barn, and the operating cost, Yeck said.

Under the conditions pointed out by the agricultural engineer, there would be the additional benefit of more comfortable working conditions.

Karl M. Gerteis Elected

SYRACUSE, N. Y.—Karl M. Gerteis has been installed as president of the Central New York Chapter of American Society of Heating, Refrigerating, & Air-Conditioning Engineers.

Other new officers are: Dr. Stanley F. Gilman, first vice president; Louis L. Schneider, second vice president; Robert A. Barr, third vice president; Edgar L. Galson, fourth vice president; Bruns P. Morabito, secretary; and Daniel C. Raasch, treasurer.

Whoops, Wrong Rating Method

Detroit Edison Cooling Ad Talks Tons=Hp. Rating But Next Insertion Changes Tune to BTU's

DETROIT — Some official faces were slightly pink at the Detroit Edison Co., local electric utility, after its first full-page advertisement of the season to promote electric air conditioning appeared in a local newspaper.

The advertisement carried a paragraph explaining to the public "what ratings mean." It said:

"Air conditioners are described in terms of tons of horsepower. A 'ton' rating means that the air conditioner cools the same as would a ton of ice which melted completely in 24 hours (a one-ton block of ice would be about the size of a piano). Since a one-horsepower motor is usually used to run a one-ton air conditioner, the terms can be used interchangeably.

"How much cooling is that? Remember, conditions vary widely, but a one-ton (or one-horsepower) unit should cool up to 550 sq. ft. or a 20 ft. by 27½ ft. room."

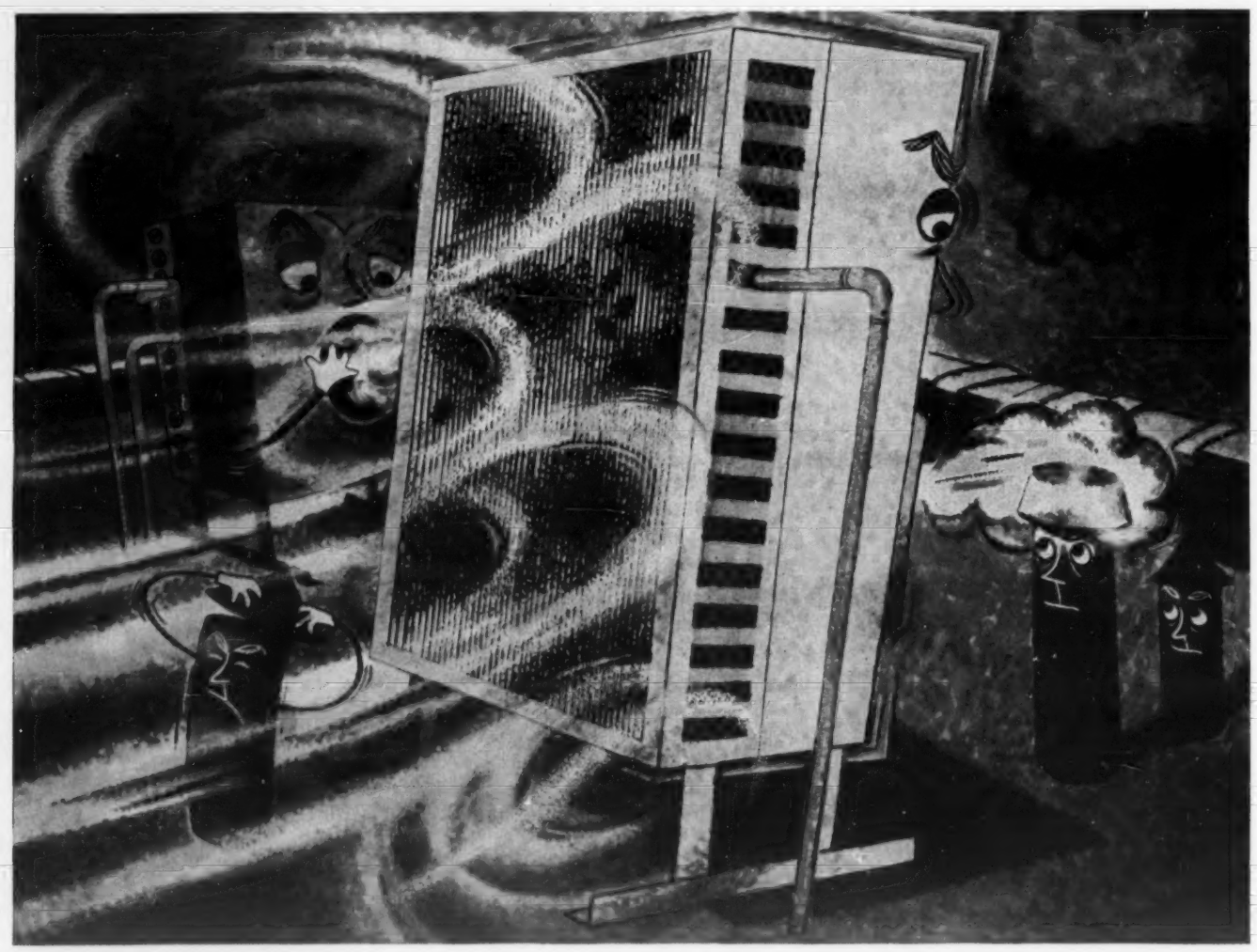
The next day, in another newspaper, the same advertisement appeared. But this time the explanation of what ratings mean read like this:

"Air conditioner capacity is often discussed in tons. A one-ton unit is said to cool the same as would a ton of ice melting in 24 hours. Capacity is also often spoken of as motor horsepower. The idea that one ton equals one horsepower is not a precise measure. The cooling capacity of an air conditioner, expressed in Btu's, is the meaningful measure.

"The thing to remember is that a one-ton air conditioner should under normal circumstances, cool a moderate-sized living room."

The "boo-boo" in the first ad was laid at the door of an uninformed advertising copy writer.

"But, you know," commented H. R. Stevenson, director of sales for the utility, "we received only one telephone call from the industry on our error. It came from Frigidaire."



Crane Elects Songer Executive Vice Pres.

CHICAGO—Election of Wesley A. Songer as executive vice president of Crane Co. has been announced by Thomas M. Evans, chairman of the board of directors.

Songer was executive vice president of American Safety Razor Corp., and prior to that he was on the president's staff at General Electric Co.

In announcing Songer's election, Evans said: "He has the sound experience needed to assist in revising the company's downward operating curve and rebuilding its sales and earnings position."

J. J. Hilt Retires

RACINE, Wis.—J. J. Hilt has retired as vice president, sales, for Young Radiator Co. after 32 years of service.

BEFORE YOU BUY, THINK:

Will your air-cooled condensers clog up fast?

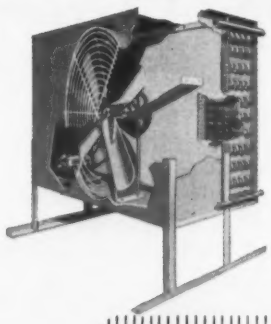
Not if they're H & M condensers with wide fin spacing

All Halstead & Mitchell air-cooled condensers and finned coils come with fins spaced wide to prevent clogging. Their exclusive Turbu-Flo fin design keeps your maintenance costs down, and improves heat transfer up to 15%.

H&M's fins are streamlined, embossed to bring about better air "wash." Since turbulence decreases resistance to heat flow through the air film, heat exchange is greater.

Finned coils come in a wide range of types and sizes: standard and non-freeze steam coils; direct expansion coils with pressure-type distributors; chilled or hot water coils. All Halstead & Mitchell coils are available from 1 to 8 rows deep, with finned heights of 12 to 36 inches, in lengths up to 10 feet.

You can order H&M air-cooled condensers in capacities of 3 to 100 tons. Be sure to specify H&M finned products from your local distributor. Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.



H&M AIR-COOLED CONDENSER WITH WIDE FIN SPACING

Halstead & Mitchell

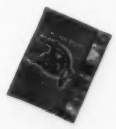
Finned Coil Products • Air-Cooled Condensers • Water-Cooled Condensers • Cooling Towers

Handy Tube Bender

Smoothly Bends any pipe or Tubing ⅜"-1⅛" O.D.

• Just a twist of the wrist assures perfect, even bends — right angle, any angle, U and offset. Save enough on ONE job to pay for your HANDY BENDER.

See your supply house—or write for free folder today.



HOLSCLAW BROS., INC.

428 N. Willow Road • Evansville, Indiana

CARRIER AGAIN MAKES HEADLINES WITH A

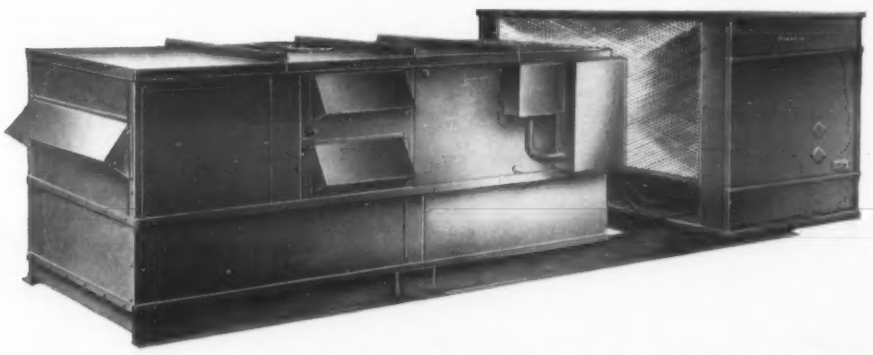
NEW ROOF-TOP COMMERCIAL WEATHERMAKER

- **Puts both heating and cooling outdoors**
- **Occupies no valuable floor space**
- **Uses only a minimum of ductwork**
- **Permits uncluttered ceilings**

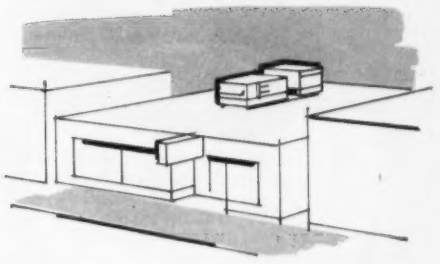
Here's the latest advance in heating and cooling for one-story buildings—the new Carrier 48B Air-Cooled Weathermaker*. Designed for roof-top installation, it provides the benefits of year-round air conditioning without extensive ductwork, without cluttering up ceilings and without tying up one inch of floor space.

This versatile unit consists of a gas-fired heating section, a fan section and an air-cooled refrigeration section for cooling—all enclosed in a weatherproof casing and mounted on rails. Two capacities fit most heating and cooling requirements—7.5 and 10 tons for cooling; 200,000 and 250,000 Btus for heating.

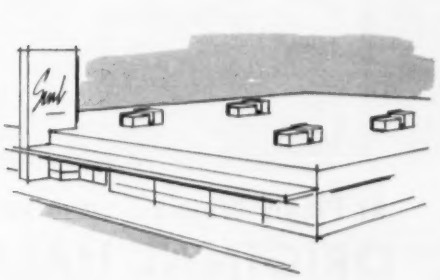
This new unit gives the Carrier dealer another great product for year-round selling. It is just one of scores of product-reasons why the Carrier franchise is the most valued in the industry. Interested in a Carrier franchise? Talk it over with your Carrier distributor. You'll find him listed in the Yellow Pages of your telephone directory. Carrier Corporation, Syracuse 1, New York. *Reg. U.S. Pat. Off.



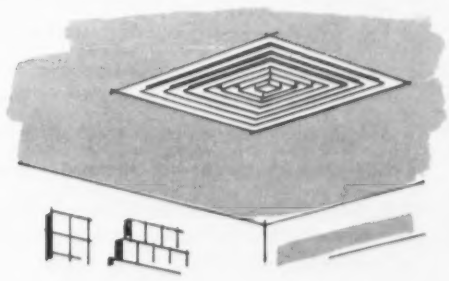
Basically the 48B is a one-piece unit, but rigging and handling are simplified by shipping the unit in two sections (base unit and fan section). It also installs with a single supply and return air duct, so only one passage must be cut through the roof. Installation is further simplified with only one electrical power connection.



A single unit will both heat and cool a small store or plant



Larger buildings require two or more units to heat and cool



One supply and return grille fits flush to ceiling

MORE PROOF OF

BETTER AIR CONDITIONING FOR EVERYBODY EVERYWHERE

Carrier

2 Theaters Take Highland Park Cooling Fee Ordinance To Mich. Supreme Court

HIGHLAND PARK, Mich.— Highland Park's water conservation ordinance that slaps a $20 per ton per year fee on owners of non-recirculating water-cooled air conditioners has been taken to the Michigan Supreme Court for testing.

Owners of two Highland Park theaters have recently filed an appeal from a decision by Wayne County Circuit Court Judge Victor Baum that found the ordinance was unreasonable as applied to the two theaters but not as applied to other users.

The city has also filed a cross appeal, fearing that other air conditioning users might sue for similar relief.

Judge Baum found that the two theaters could not pay the fee out of profits, could not afford to convert to water conserving equipment, and would lose their competitive position without air conditioning.

For Your Reprint Copy

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.
Only 25¢ each.

NAFFP To Meet March 6-10

WASHINGTON, D. C. — The National Association of Frozen Food Packers announced that its 19th annual convention-exposition will be held March 6-10, 1960 at the Conrad Hilton hotel in Chicago.

Air Force Refrigeration, Cooling Conference Set for July 13-16

WASHINGTON, D. C. — A four-day U. S. Air Force refrigeration and air conditioning conference will get under way Monday morning, July 13, at Wright - Patterson Air Force Base, Dayton.

This is a conference of Air Force personnel responsible for all policy as well as for operation, maintenance, repair, and minor construction of refrigeration and air conditioning equipment at Air Force installations throughout the world, according to William T. Smith, chief of the Air-Conditioning & Refrigeration Section, Headquarters, USAF.

A program of discussions of air conditioning and refrigeration problems by Air Force personnel will be augmented by speakers from the industry and a panel discussion in which industry technicians will participate.

Among features programmed are a talk Monday morning by Paul M. Augenstein, president of Airtemp Div., Chrysler Corp.; four presentations Monday afternoon on heat pumps; and a weather data symposium Wednesday morning.

Thursday morning's program includes talks on Dept. of Defense air conditioning policy, the Air Force air conditioning program, and "The K-5 Report and Air Conditioning Projects," and an open forum on air conditioning policy. A general open forum is scheduled for Thursday afternoon.

Among the many other speakers will be representatives of the American Society of Heating, Refrigerating & Air-Conditioning Engineers, the Air-Conditioning & Refrigeration Institute, and the Refrigeration Service Engineers Society.

It's a Cool Lift

THE SCENIC ROUTE to the Saxony hotel's "Ivory Tower" supper club is via this glass air conditioned elevator on the outside of the 16-story building. Because the elevator faces west to offer a view overlooking Miami Beach, Biscayne Bay, and Miami itself, it catches the full effect of the evening sun. So a 2-ton Westinghouse air conditioner keeps passengers comfortable during their 132-ft. trip from ground to roof-top. Exterior of the unit is completely covered. Inside the elevator are two diffusers and one woven wire return air duct. Unit is controlled by a switch in the elevator panel and will operate on their fan only or full cool. Close-up view of elevator appears on page 1.

Emerson Radio Joins NEMA Room Unit Section

NEW YORK CITY—Emerson Radio & Phonograph Corp. has joined the Room Air-Conditioner Section of the National Electrical Manufacturers Association, it was announced by Joseph F. Miller, NEMA managing director.

The company's voting representative is Stanley L. Abrams, vice president-air conditioning.

It was also announced that Sun-Tron Corp., Chicago, has joined NEMA's Electric House Heating Equipment Section. Roger A. Weiler, general manager, is voting representative.

Louisiana Firm In New Home

LAFAYETTE, La. — Butcher Air Conditioning Co. has held open house in its new home at 501 Surrey St.

American-Standard Div. Appoints R. C. Habicht

DETROIT — Appointment of Richard C. Habicht as product manager in charge of the special packaged products department has beeen announced by E. W. Petersen, vice president-marketing for American-Standard Industrial Div.

Habicht will be responsible for development, promotion, and sale of special-purpose American Blower brand fans and blowers. He was formerly assistant manager of the Fluid Drive department.

Bohn Half-Rounds keep fruits and vegetables temptingly fresh and crisp for Piggly Wiggly customers by maintaining precise control of temperature and humidity in produce coolers.

At Piggly Wiggly... another installation of

"ORIGINAL HALF-ROUND" BOHN EVAPORATORS

Features of the Bohn Model HR

- Built-in louvers... *a Bohn exclusive*... increase air "throw" to provide more uniform temperature in refrigerated space.
- Guaranteed full-rated performance; UL listed.
- 7 models, capacities from 260 to 1080 BTU's at 1° T.D.
- Grained aluminum housing; rust-proof fittings, built-in heat exchanger, chrome-plated fan guard with optional plastic filter.
- Double drain pan prevents sweating; hinged for easy access.
- Life-lubricated motor with thermal overload protection.

SEE YOUR WHOLESALER for latest catalogs and price lists on BOHN's *complete line* of standard unit coolers, low temperature units. and air-cooled condensers.

Bohn is proud that its Half-Rounds were selected for this ultra-modern new Piggly Wiggly store at 823 E. Murdock Avenue, Oshkosh, Wisconsin. Owner and operator is Mr. Cliff Sebora.

BOHN

Buy the known line... the BOHN line

Aluminum and Brass Corporation

Betz Division • Danville, Illinois

A COMPLETE, SIMPLE METHOD FOR

PREVENTING SCALE CORROSION SLIME

IN AIR CONDITIONING SYSTEMS

METRO EZ TREAT ·TRADE MARK

CONVENIENTLY PACKAGED IN DISPOSABLE FEEDER-CANS

Now you can eliminate the trouble and fuss ordinarily involved in a complete treatment of smaller air conditioning systems.

Metro EZ Treat is a one-package treatment with triple chemical action to prevent scale, corrosion, and slime. Protects your expensive equipment all season long.

Metro EZ Treat is the answer for owners and operators of 5-to-50 ton units who want an effective, easy-to-use water treatment complete in one package.

See our representative in your area or write us for complete information.

THROW THESE ALGAECIDE TABLETS INTO PAN WATER
METRO EZ TREAT
3-IN-ONE TREATMENT
JUST PLACE THIS FEEDER-CAN INTO PAN OF EVAPORATIVE CONDENSER OR COOLING TOWER

NO ELABORATE FEEDING OR TESTING EQUIPMENT NEEDED!

METROPOLITAN REFINING CO., INC.

50-23—23rd STREET LONG ISLAND CITY 1, N. Y.

First ASHRAE Meeting--

(Continued from Page 1)

the society, and will hold office until the semiannual meeting in Dallas in February. This six months' term of office is provided for in the rotation of officers under the merger agreement. Hess is the first (and probably only) man to have been president of ASHAE, ASRE, and ASHRAE at various times of his career.

Other new officers are D. D. Wile, first vice president; W. A. Grant, second vice president; R. H. Tull, third vice president; and J. Everetts, Jr., fourth vice president. F. Y. Carter is first treasurer, and J. H. Fox, second treasurer.

The technical program covered a wide variety of subjects, and if this one is any indicator, those members who try to "touch all bases" at these meetings will need a bicycle or a motor scooter. On some mornings there were two technical sessions and a conference going simultaneously, and at Lake Placid one of these sessions was in some instances about a mile away from the others.

Another noteworthy element of the sessions was the fact that there were relatively fewer papers devoted to reports of research conducted at the ASHRAE Research Laboratory.

'Status of New Utilization Voltage Proposals'

In the "forums" in which the engineers get together to discuss "and throw out ideas on announced subjects on an off-the-record" basis, the subject which drew the liveliest discussion was "Status of New Utilization Voltage Proposals" at which A. S. Anderson of Ebasco Services, Inc. served as moderator.

The discussion centered about one of the recommendations made early this year by the Edison Electric Institute-National Electrical Manufacturers Association Committee on Higher Secondary and Utilization Voltages. This recommendation stated:

"It is recommended that the following be adopted as standard nominal voltages and that steps be taken to revise the EEI-NEMA publication 'Preferred Voltage Ratings for A-C Systems and Equipment, ASA c 841-1954' to recognize these standards:

"(a) 240/480 volt single phase
"(b) 240/416Y volt
"(c) 265/460Y volt (alternate-industry and commercial applications)."

From the interest shown in the subject and the forum discussion it seems probable that the subject will be pursued in some future formal technical session of the society.

Sound from Equipment Standard Discussed

One new proposed industry standard was discussed at the meeting, this being "Proposed ASHRAE Standards For the Measurement of Sound from Equipment." In presenting a discussion of the factors that the standard would cover (the standard itself was not presented). C. M. Ashley, chief Carrier staff engineer, expressed the hope that the industry might have the sound standard within a year.

The primary standard would be developed for equipment which will radiate sound to the air in a room or to the atmosphere outside. This category includes a wide variety of equipment ranging from room air conditioners and room fan coil units through self-contained air conditioners, ventilating fans, unit heaters, cooling towers, and refrigerating equipment to large refrigerating machines of the reciprocal, centrifugal, and absorption types.

A sub-standard of this standard can provide for the special problems involved in connection with room air conditioners, attic units and the like in which a portion of the equipment radiates to a room and another portion radiates to the outside.

A second standard would cover the sound power level transmitted by fans through ducts.

A third category of equipment is that of duct terminals such as outlets, grilles, induction units and the like.

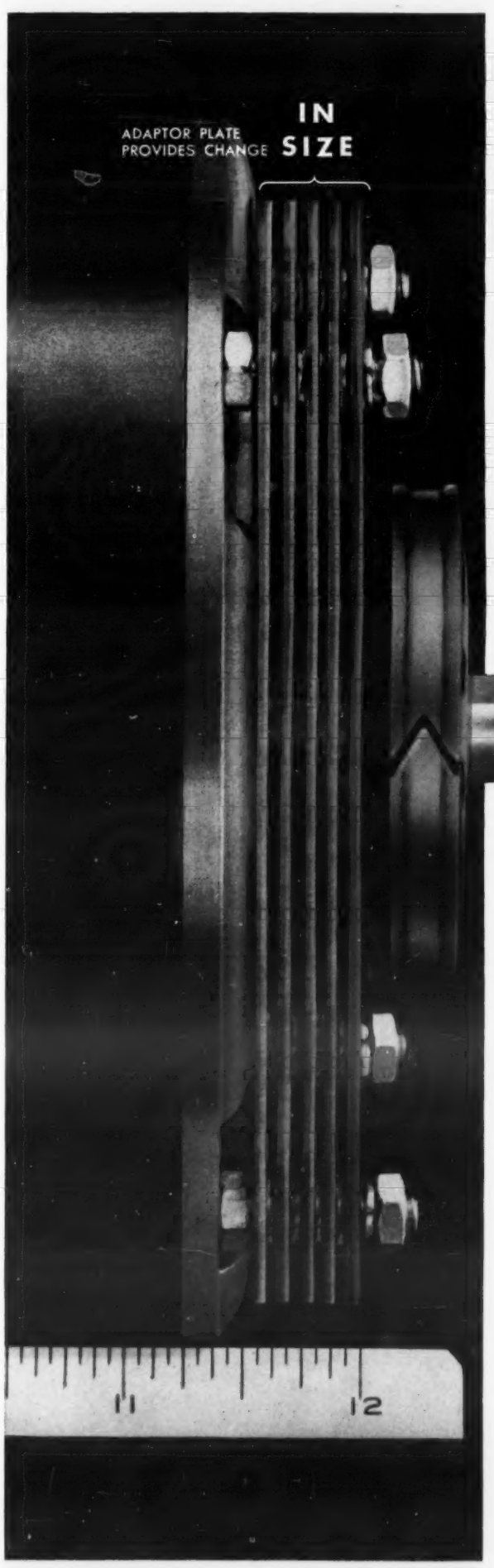
A standard of this type, Ashley explained, must permit measurement of performance of equipment in terms which will be significant regardless of environment. The results must also be capable of reasonable correlation with the subjective impressions of observers in spaces where the equipment is used.

Discussion of the presentation indicated that a major point in issue in any such standard might involve some of the test equipment involved, including the size of the test rooms to be used.

Industrial Ventilation

The Industrial Ventilation Conference which formed part

(Concluded on Page 8)



HERE'S A FAN MOTOR THAT

CHANGES SIZE!

Stock this new General Electric fan motor—solve most air conditioner replacement problems.

Now, by stocking this versatile motor, you can replace practically any 5½ inch diameter shaded-pole fan motor on today's room air conditioners.

As a result of the trend to thinner room air conditioning units over the past 5 years, you're being called on to replace motors of many different lengths. You can match almost all of these varying mounting dimensions by simply adjusting the position of the specially designed mounting adaptor along the motor's extended through bolts. And, of course, you can remove the adaptor entirely for band or through-bolt mounting.

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Available in ratings from 1/10 to 1/4 horsepower, this new replacement motor gives you the same General Electric quality designed and built into every Form G motor—outstanding moisture resistance, top-notch insulation and long lubrication life. Call your nearest General Electric distributor or your G-E Apparatus Sales Office about this new replacement fan motor today. Section 702-103, General Electric Co., Schenectady 5, N. Y.

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'All-Electric Homes' To Be Pushed

Detroit Edison Ready To Aggressively Promote Electric Home Heating In Southeastern Michigan

DETROIT — Detroit Edison Co., electric utility for southeastern Michigan, will start aggressive promotion of electric home heating starting this year, H. R. Stevenson, sales manager, informed the Detroit Heating & Air Conditioning Association recently.

"Detroit Edison's interest in electric heating is very high right now and it's going higher," he told the heating contractors. "We are actively seeking heating business and are optimistic about the market potential.

"During the next five years, our major residential promotions will be directed to electric heating, the electric water heater, and the all-electric home."

Stevenson emphasized that he included the heat pump as a means of electric heating. But he felt it was less popular in this area because there was less need for air conditioning in summer.

Adding 3 All-Electric Homes Every Week

"Already in our service area," he said, "we are adding three all-electric homes every week."

Stevenson noted that as of the first of June, the utility has added a new low step in its residential rate that would particularly affect electric heating applications. It is 1.94 cents per kwh after the first 750 kwh.

However, Stevenson emphasized, electric heating is the most costly form of heating and its likely to remain so.

"To tell you the truth," he declared, "I don't think rate is any real deterrent for those who really want electric heat.

"People who have electric heat think of it the way they do the automatic transmission, power brakes, and power steering in their automobiles. And they buy it for the same reasons — convenience, comfort, safety, labor saving.

"As it is, we have reports of electric heating costs being as low as 16 cents per sq. ft. per year. Five and six-room houses with 1,000 sq. ft. of floor space are consuming only 1,290 kwh per year for each kwh of heat loss. This brings the heating cost down to about $280 a year."

Stevenson pointed out that it is incorrect to estimate annual kwh usage by multiplying the heat value of a conventional fuel and then converting the B.t.u. result into kwh.

"Expericence shows that the amount of heat required is considerably smaller than the amount usually supplied by fuel-fired equipment.

"Why this is so, we don't really know. The reason is probably a combination of many things, such as individual room control, higher humidity, greater cost consciousness, orientation, and design of the building, tighter seals around doors and windows."

Whatever the explanation, he added, "it seems to be true that people just plain feel warmer with less heat when the source is an electric unit."

To correct for this, Stevenson suggested that a new constant be used in the formula for finding fuel consumption.

This formula, as given in the ASHRAE Guide, is heat loss times degree days times 24, divided by Fahrenheit design temperature difference. For electric heat, he said, the Guide recommends 18.5 instead of 24 as the constant.

"Here in southeastern Michigan, we've found that 14.1 is a better figure," Stevenson declared.

He pointed out, too, that buildings cannot be designed as they would be for conventional heat and then electric heat substituted. They must be well insulated and should be oriented on its lot to take advantage of solar heat.

"Even differences in altitude may have a marked effect on the design temperature of closely adjacent areas," he said.

He asserted that installations of electric heat normally run only 25 to 30% of the cost to install a quality forced hot water system with equivalent zone control.

"Much of it comes through the comparative low cost of the heating units and the elimination of chimney and piping," he observed.

Find All-Electric Homes Cheaper To Build

"One local project building has found the all-electric home can be constructed much faster than the conventional project with labor costs reduced as a consequence."

Stevenson noted that Edison has today in its territory more than 1,200 residences using resistance heating. It also has 20 homes and 55 commercial buildings with heat pumps. Commercial space heating customers number 124.

"We expect the biggest electric heating impact on the new home market will occur in the Detroit area this year. Homes are now under construction in two subdivisions heated by baseboard type resistance units."

What is Edison doing to prepare for the expected demand?

It has completed training of 550 electricians who have become qualified electric heating specialists. It has established a routine for follow up of inquiries by these qualified contractors.

It displays electric heating in all 75 customer offices. It will insert a series of quarter-page advertisements in all three metropolitan Detroit dailies through October. It will participate in cooperative advertising with qualified contractors.

It has asked for and gained support from such allies as the

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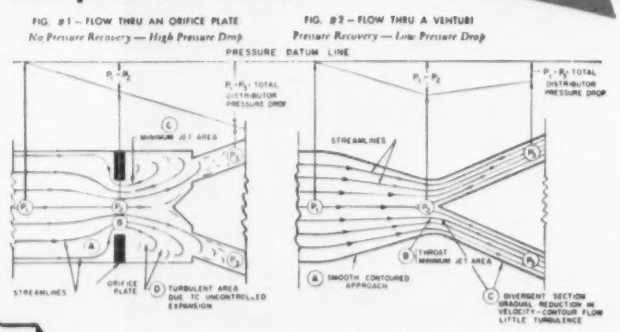
FIG. #1 – FLOW THRU AN ORIFICE PLATE
No Pressure Recovery — High Pressure Drop
FIG. #2 – FLOW THRU A VENTURI
Pressure Recovery — Low Pressure Drop
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insulation manufacturers and heating unit manufacturers.

Stevenson reported that a school has just been completed for over 550 electricians. It consisted of four evenings of instruction on insulation, calculation of heat losses and job layout, application and design of equipment, code requirements, and electric rates.

"We plan to continue these schools," he declared.

"In all meetings we emphasize the need for close follow-up on installations. Grievances occur when the seller has not done the right job for the customer—not because of operating costs.

"A guaranteed service policy is what the customer wants and we're trying to do everything we can to see that he gets it.

"We urge contractors to ally themselves with reputable insulation contractors so the customer will get good insulation.

Utility Keeps Close Contact With Customer

"We want the contractors to realize the importance of keeping public confidence in electric heating.

"We keep close contact with every heating customer, check his bills, and work with contractors and dealers to resolve service problems as they arise.

"For example, with the manufacturers' assistance, Detroit Edison servicemen have been specially trained to handle emergency 'no heat' calls from electric heating customers.

"Because our men are located throughout our service area, in most cases the customer's call can be answered much more promptly than by a dealer's service representative.

"We expect that many minor problems can be corrected immediately. More complicated repairs will be referred to the dealer."

Heating Costs In Detroit Area Cited

Stevenson cited some operating costs for residences using the heat pump and resistance heating. Detroit has a 6,400 degree day heating season.

In a seven-room house containing 1,512 sq. ft. and occupied by a family of four, a 5-ton heat pump has operated for an annual cost of $263.37. The heating costs works out to about 17.4 cents per sq. ft.

This is a concrete slab construction home with no basement. Perimeter of the floor is insulated with fibre board 2 in. thick and 2 ft. wide.

Baseboard resistance heat was installed in an existing home with 2,448 sq. ft. of living area plus a 10 by 14-ft. enclosed breezeway. A 3-in. foil-enclosed blanket of fibreglass was placed between the joists under the floor (the house has a 4-ft. crawl space), fibreglass was blown into the walls to the thickness of the studs, and 6 in. was put over the ceiling.

Just under 23 kw of heat were installed. Operating cost is estimated at $516 a year, about $155 more than with the former oil furnace.

Stevenson noted that a "Thermo-Base" system is being tried in Detroit but no operating figures are yet available. This system uses ducts to circulate warm air through the living area by blowing it over the baseboard heating elements.

It offers such advantages as economy through zone control, less radiation loss due to lower operating temperatures, no duct heat loss, and provision for such optional equipment as electric humidifier, electronic air cleaner, and air conditioner.

In reply to a question from the floor as to where the heating contractor would fit into this picture, Stevenson said he foresaw an entirely new type of contractor evolving to handle these installations—the electric heating contractor. He would be a man with knowledge and ability to install electric heating equipment but not necessarily an electrical contractor. He would also be familiar with the principles of heating and duct layout.

"But," Stevenson declared, "the business will go to the man who gets out and sells it."

350 Enroll In Fla. Home Heating, Cooling Course, 26 from FHA Staff

MIAMI, Fla.—More than 350 "students" were enrolled in four home heating and air conditioning training courses recently completed in Miami, West Palm Beach, and Ft. Lauderdale.

The students included 26 members of the local Federal Housing Administration staff and representatives of 140 heating and air conditioning dealers, architectural and engineering firms, government agencies, and utility companies.

The program was sponsored by the Florida Home Heating Institute in cooperation with the South Florida office of the FHA.

Edwin C. Hamilton, chief architect; R. J. O'Connell, heating consultant; James Burgun, chief inspector, and Harold Lochner, FHA inspector, arranged for instructors and participated in the sessions by introducing speakers and conducting question-and-answer sessions.

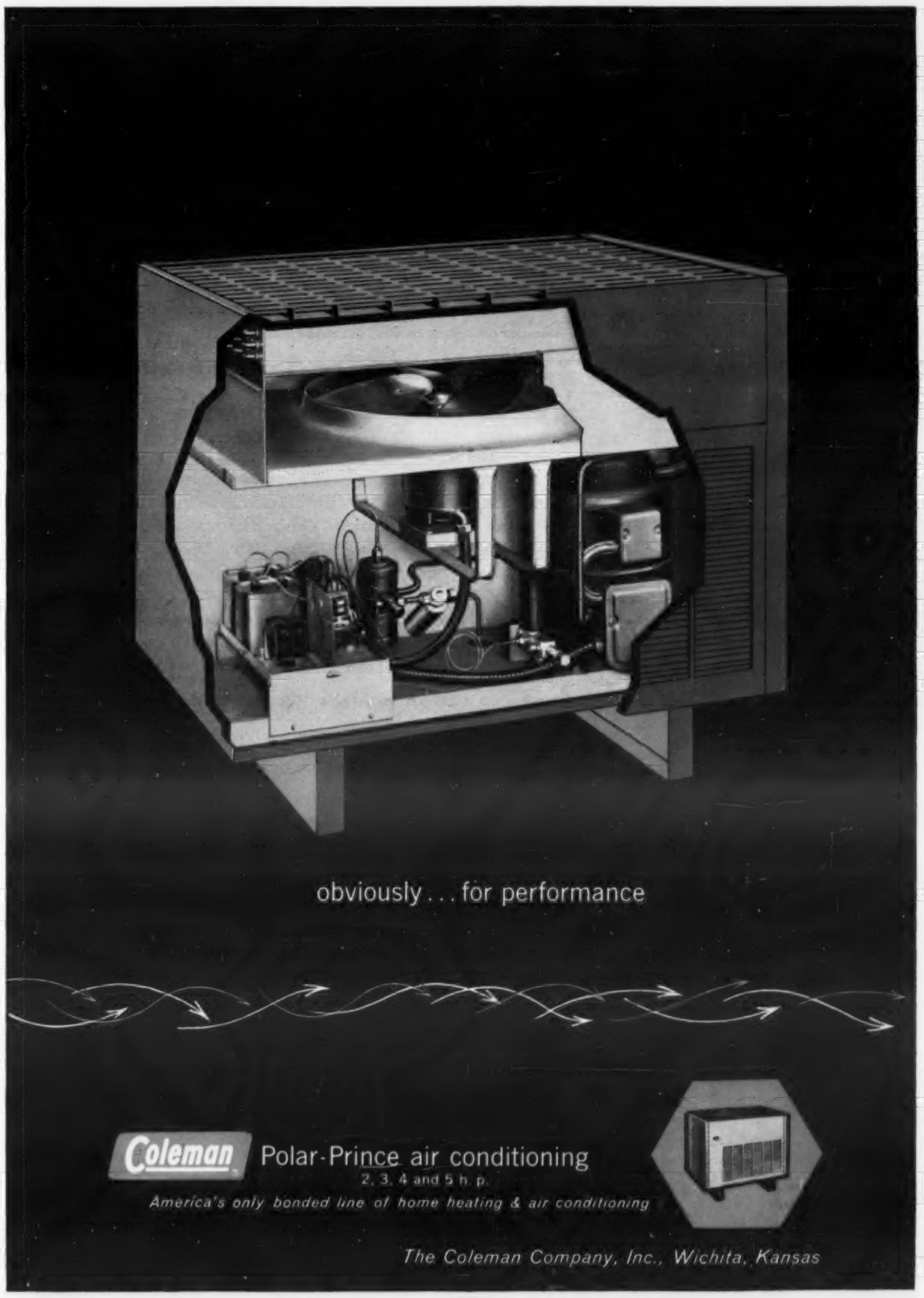
Text books used in the courses were those of the National Warm Air Heating & Air Conditioning Association. Edwin L. Shaw, FHHI president, awarded certificates of completion at a social program at the conclusion of each of the courses, two of which were held in Miami.

Instructors included E. B. Hauf, service manager, Richmond Div., Rheem Mfg. Co.; Hugh Blumenshine, product manager, and Wally L. Etherton, quality control manager, Holly-General Co.; Darrell W. Canady, residential representative, Minneapolis - Honeywell Regulator Co.; Walter H. Ollenburg, chief field service engineer, and Fred R. Zwanzig, field sales manager, Heil-Quaker Corp.

Also, Donald F. Warner, residential sales training specialist; Douglas Howard, appliance equipment specialist; Quincy P. Carvel, sales representative; and Robert Brimer, residential specialist, all of Carrier Corp.; and Coy S. O'Barr, General Controls Co.

G-E Issues Bulletin

SCHENECTADY, N. Y. — A two-page bulletin—GEA-6803A—describes General Electric Co.'s new 3ARR-8 magnetic line contactor for air conditioning applications.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First ASHRAE Meeting--

(Concluded from Page 5)

of the technical sessions turned up some interesting information on the kind of markets that the industrial field can offer for the industry's products.

Steel Plant Needs

Describing the progress made in providing for employe comfort in the steel industry, F. E. Tucker, industrial hygienist for Weirton Steel Co., pointed out that whereas before World War II little was done beyond making some openings to let outside air come in, Weirton Steel Co. alone, since 1945, provided

"Conditioned air" (heating and ventilating) for 2 billion cu. ft. of steel plant area.

365 tons of refrigeration to provide comfort cooling for operational employes.

Will provide "conditioned air" for all new construction, and probably comfort cooling to a much greater degree of new construction.

"So long as we are dealing with human beings, we can be sure that they will not be satisfied with their present environment," said the Weirton man.

"The next step that we take will probably involve comfort cooling and complete air conditioning."

Tucker said that more and more "hot spots" in steel plants were getting comfort cooling, and that it was proving its worth in improving efficiency.

Pharmaceutical Plants

Ventilation, air pollution control, and air conditioning are assuming increasing importance in pharmaceutical plants which supply the nation's drugs and medicines, declared P. J. Marschall, chief mechanical engineer, Abbott Laboratories.

Among the factors which call for special air handling and air control in these plants are the necessity of creating an acceptable environment for workers, quality control for the product, good plant housekeeping, and consideration for the life of the plants' physical properties.

In fact, said Marschall, some of the air handling problems with new chemical compounds are so complex that before a decision is made to enter into the manufacture of certain items, full weight is given to the design considerations involved in eliminating contaminants. If this would seem likely to be too costly, then the laboratory is asked to develop plans for a different product, or a different method of manufacturing it.

The conclusion that an air distribution system using round ceiling diffusers was more satisfactory than those using high sidewall diffusers or baseboard diffusers came out of the paper "Evaluation of Three Room Air Distribution Systems for Summer Cooling," by J. J. Reinmann, Alfred Koestel, and G. L. Tuve. The paper is the result of research that was sponsored by the ASHAE in cooperation with Case Institute of Technology.

The air distribution systems were evaluated on the basis of specific criteria for comfort, with arbitrary comfort limits established on the following three points:

1. Draft, a maximum of 10% of the subjects objecting, that is, 90% tolerability.
2. Air velocity, a maximum of 50 f.p.m.
3. Vertical air temperature difference from floor to ceiling of occupied zone, 3° maximum.

The airflow patterns, air supply volume and cooling load were measured and correlated with comfort conditions, for a variety of simulated outdoor temperatures up to 100° F.

The high sidewall system would meet the requirements of the established comfort limits only if the cooling loads and air supply volumes were low.

The system of baseboard radial diffusers, while it produced good mixing of supply and room air with high rates of air supply, exceeded the specified draft limits. Excessive air motion was caused in some parts of the room, while there was stagnant air in other parts.

Since the system using ceiling diffusers was capable of satisfactory operation over a wide range of loads, it was therefore concluded to be more satisfactory than either of the others for comfort.

Measuring Noise

In another technical session on noise, J. P. Laughlin, product engineering department, Whirlpool Corp., stressed that "The *quality* of noise is devious; it can be both objective and subjective. A refrigerator sounds one way in a test room, another way in a house. It will vary from house to house—depending both on the house and on the occupants."

Consensus at the session was that *sound power,* rather than sound pressure, will come to be the standard measurement in noise studies and that the reverberation room technique will be adapted.

Pointing out that noise acceptance is always "a compromise," Royal S. Buchanan, Westinghouse Electric Corp., pointed out that "As we make units quieter, people will expect them to be quieter. Our goal is obviously to approach zero sound, so that standardization may never come or be practicable."

Centrifugal Vs. Absorption Systems

Centrifugal compression refrigeration has increased 150% over 1955—this in the face of increasing inroads of absorption refrigeration, according to H. E. Caswell, manager, centrifugal refrigeration engineering department, Carrier Corp.

Other talks in this technical session on compressors discussed the cost per ton comparison between centrifugal and absorption systems, relative life.

A final paper at the session discussed the status of the free piston compressor in air conditioning. "There is no longer any doubt about the functional capabilities of the free piston compressor," reported R. J. McCrory, chief of mechanical research division, Battelle Memorial Institute. "Now the task is to determine ultimate component construction and reliability."

Winners of cash awards presented annually for best technical papers were announced at the meeting. The Wolverine Award, presented by Wolverine Tube, Div. of Calumet & Hecla, Inc., went to Prof. H. M. Hendrickson. The Klixon Award, presented by Metals & Controls Corp., went to Dr. H. O. Spauschus and R. S. Olsen.

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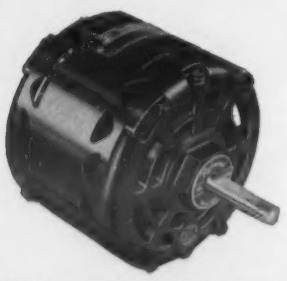

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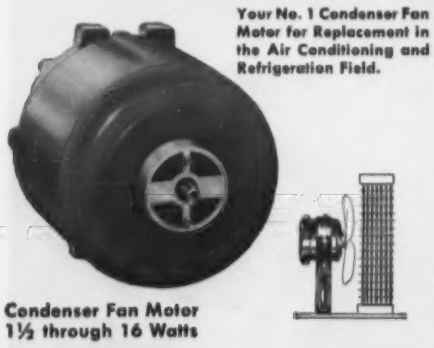

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I-B-R Adopts Record Budget for Industry Research, Testing, and Education Program

WARREN S. HARRIS (right), research professor who conducts I-B-R hydronic heating and cooling research program at University of Illinois, receives symbolic key to new I-B-R Hydronic Research House from L. N. Hunter, chairman of I-B-R's research committee. New split-level research house was dedicated June 3 at I-B-R annual meeting, Absecon, N. J. (See detailed story in June 29 NEWS.)

ABSECON, N. J.—A record budget for industry research, testing, and education and the opening of a new hydronics research house were announced at the annual meeting of the Institute of Boiler & Radiator Manufacturers.

Convening here, 150 executives of the I-B-R membership approved plans for the expansion of institute activities that are designed to aggressively advance the industry's fight to capture a larger share of the home heating market. Members also participated in ceremonies formally dedicating the new split-level research house.

According to I-B-R General Manager Robert E. Ferry, an institute budget in excess of $250,000, an all-time high, was unanimously approved by the membership to back I-B-R activities during 1960, including heating and cooling studies in the new research house, operation of the I-B-R test lab and schools, and production of technical guides and other publications for the trade.

The new "I-B-R Hydronic Research House" was described by Warren S. Harris, research professor at the University of Illinois, as a tri-level dwelling that reflects current architectural trends and incorporates many "hard-to-heat" and "hard-to-cool" design features.

Prof. Harris explained that the industry's heating and cooling equipment would be put through severe tests in the new research house. The use of large glass areas, cathedral-type ceilings, and many other modern design features will make possible a study of a wide range of current and future heating and cooling problems, he reported.

Construction of the new 10-room, 2½-bath research house was completed recently in Urbana, Ill., where the institute has conducted a home heating and cooling research program in cooperation with the University of Illinois since 1940.

In a report on I-B-R's educational program, Arthur Wales, field training director, cited case histories showing how contractors had increased their hydronics business after attending the I-B-R Heating and Cooling School.

The current I-B-R school schedule will be completed in August and a completely new school program will be developed for 1960, it was reported by Hilda Eisenhardt, assistant general manager.

To begin about April 1, the new school will include two new I-B-R publications as text books. Several of the existing I-B-R Guides that have been used as text books in the course will be revised, based on results of latest hydronics research.

One of the new publications, to be released shortly, will cover methods of reducing installation costs. The other will provide details of installation techniques for the small pipe hydronic system which was developed and tested last winter in the old I-B-R Research Home. The small pipe system uses flexible tubing with diameters as small as ¼ in.

A status report on a proposed rating code for hot-chilled water fan coil units was presented by general manager Ferry.

Work on the initial phases of the proposed code has been completed with the cooperation of I-B-R members as well as other associations and other manufacturers interested in air conditioning products.

In his annual report to the membership, Ferry discussed various cycles experienced by the industry since the institute's formation 44 years ago.

The current cycle, he said, involves the years 1950-59 during which the hydronics industry backed the expansion of I-B-R and moved into a "dynamic position" in the home heating field. Ferry said the coming cycle, the 1960's, offers an unusual potential for advancing the hydronics industry further.

In a report on I-B-R research, Prof. Harris noted that initial work in the new research house will include a study of comfort factors such as air movement from level to level, humidity conditions and temperatures of walls, floors, and ceilings.

Guest speaker Burgess H. Jennings, director of research, American Society of Heating, Refrigerating & Air-Conditioning Engineers, commended the hydronics industry for its I-B-R research program and noted that the existence of successful, expanding industry and the nation depending upon research.

Members of I-B-R's Marketing Research Committee, headed by Chairman Harold C. Day (American-Standard), reported on the results of several studies conducted during the last year.

A task force of the Marketing Research Committee submitted a preliminary report on a study of industry statistics. It was noted that I-B-R plans to use the preliminary findings of the task force to develop a program which would enlarge the scope of its statistical research work, providing additional facts on volume of shipments. This statistical information would be given wide distribution, it was explained.

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Inside Dope

By GEORGE F. TAUBENECK

(Concluded from Page 1, Col. 1)

Going to bat most times in one inning—3. (He shared this with 14 other players.)

Most base hits in one inning—3. (Tied with three other players.)

Scoring most runs in one inning—3. (Shared with two other players.)

From Waco, Rye was sold to another league, whence he faded from the baseball scene.

His inning of glory should have been headlined:
"THE RYE CAME THROUGH."

What's the Use of Kids?

Between acts of a New York play a Detroiter encountered Cincinnati Manager "Birdie" Tebbets in the theater lobby.

"Hiya," the Detroiter hailed. "How is your wife, and your kids?"

Tebbets stepped on his cigarette and replied, absent-mindedly:

"Hope I can find a coupla right-handed pitchers amongst them next spring."

As a teen-ager in San Francisco Joe Cronin got his start in semi-pro ball. Once upon a Saturday night, proudly he showed his mother a $10 bill he received for short-stopping that afternoon.

"Dear me," startled Mrs. Cronin, "if I'd known baseball paid so well I'd have made your father quit the railroad years ago."

Frequently huge Ernie Bonham, a whiledom Yankee pitcher, was called "Tiny." Other times his nickname was "Jumbo."

"They call me 'Jumbo,'" reasoned Bonham, "because I work for peanuts."

Like Grandfather Said

Believe it or not, an organized baseball team collected six hits (including three triples, a double, and two singles) *in one inning*—but couldn't push a runner across the plate. On Memorial Day, 1890, an Indiana Trolley League team registered that feat.

Here's how: First batter tripled. He tried to score on a short passed ball, and was thrown out at the plate. Second batter lined over the centerfielder's head, and was tagged out when he tried to stretch his clout into an inside-the-park home run.

Third batter also tripled, but prudently squatted on the "hot corner."

Hitter Number Four topped a roller toward third base. Expecting it would roll foul, the fielder let it go until the batter reached second. It stayed fair, and No. 4 was credited with a two-bagger.

Fifth batsman bunted. The pitcher bluffed the runner back to third. In so doing the bunter made first. So, with two out, the bases were loaded.

Sixth batter smacked a drive into the pants of the man perched on first. Automatically the latter was out when the ball struck him. Mister Six received credit for a base hit, but the side was retired.

Three triples, a double, and two singles in a half-inning. But no tally on the score sheet.

Midnight Revelations

"We umpires are like women," quipped Larry Goetz.

"We make decisions quickly, win all arguments, and don't believe a man is safe when he is out."

Yankees were being measured for uniforms in Florida.

"What's your cap size, Yogi?"

"Now, or when I'm in condition?"

As a last-ditch attempt to funnel a fun-loving pitcher onto the straight and narrow track, John McGraw sent a paycheck directly home to the latter's wife.

Few days later McGraw informed this fellow he would be the starting hurler.

"Huh uh," rejected the moundsman. "You're payin' my wife now. Let her pitch."

Hoot's Heroism

Longtime inhabitants of the bleachers at Briggs Stadium (and these more-or-less "regulars" are a grand gang of ill-assorted but knowledgeable individuals) agree on two things only:

(1) Bill Tuttle is the most magnificent centerfielder since Tris Speaker;

(2) Their happiest memory consists of an ultra-dramatic night game against the New York Yankees, June 23, 1950.

Tommy Byrne, to whom the Tigers were "cousins," hurled for the Yanks; Diz Trout for Detroit.

Thanks to six Yank home runs and Byrne's effectiveness, New York enjoyed a six-run lead in the seventh inning.

Gloom pervaded the bleachers. Any sensible man knew that the Tigers had no chance.

A couple of walks and an infield miscue filled the bases full of Tigers. Old-fogger Trout was at bat with two out. "So what?" was the bleacherites' dismal reaction.

Rather startlingly, an enormous colored man stood aloft, waving folding money in both hands. "I bet anyone even money Trout homers," he bellowed. There were plenty of takers for this ridiculous wager.

Impossible, of course; but pitcher Trout did slam a grand-slammer into the upper right field seats.

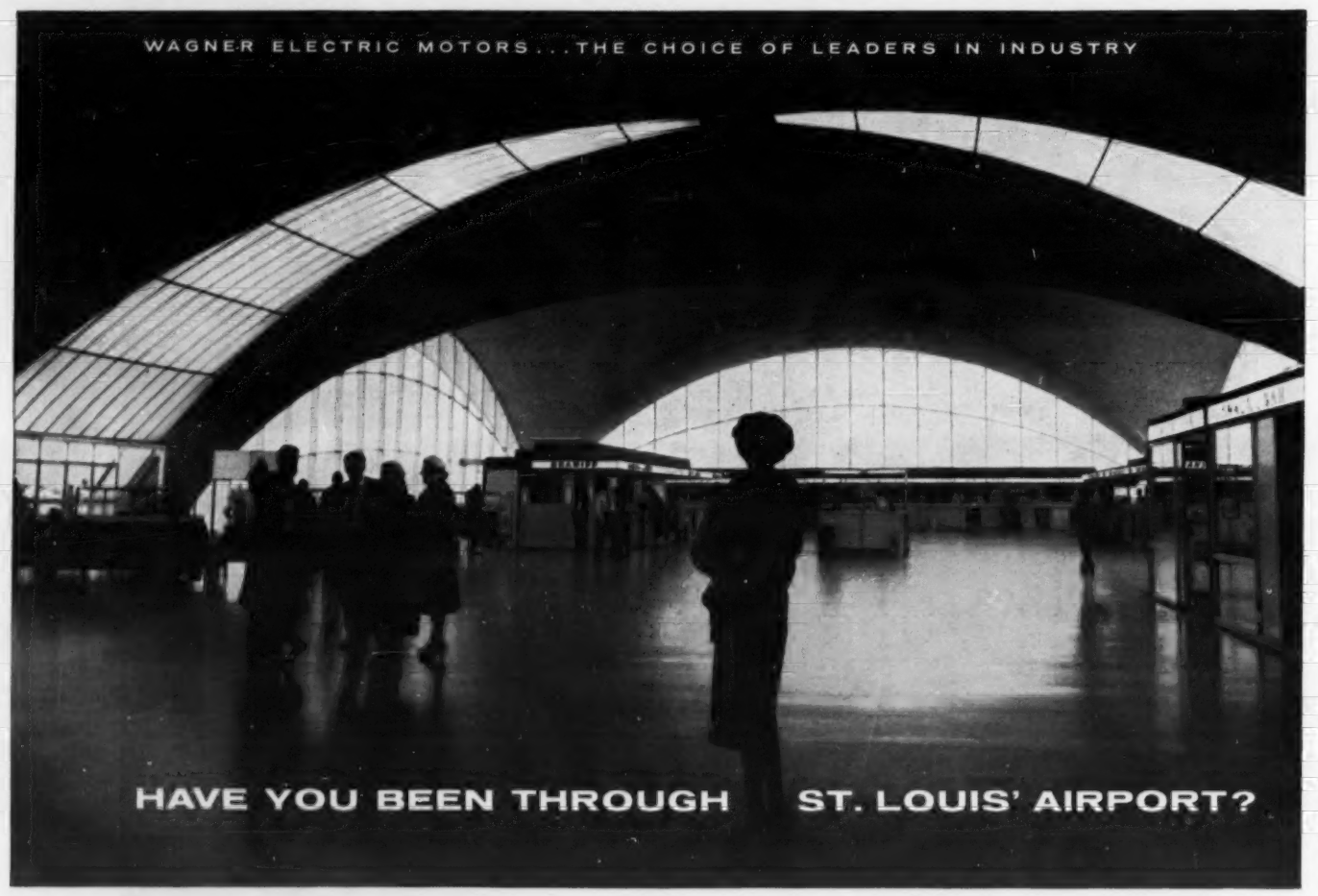
The odds-defying negro giant collected from everyone in sight, filled his hat and pockets with green stuff of various denominations, and "glory-be'd" downstairs to the beer concession.

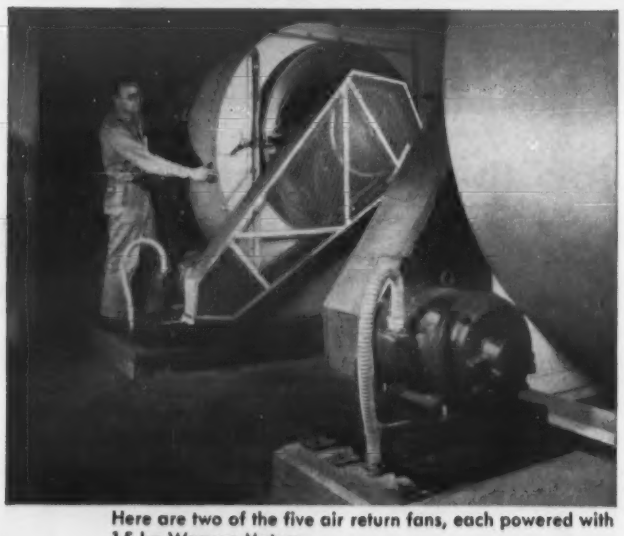
A happy fluke; but the Tigers were still two runs behind in the last of the ninth. Two out, two on, Hoot Evers at the plate. Hoot, although a good man in the clutch, wasn't celebrated as a long ball hitter. Hope was scant.

Straight toward peerless Joe DiMaggio in centerfield Evers propelled a rising line drive. It caromed off the edge of Joe's glove.

DiMag chased it down, and rifled the ball homeward. Incredibly, Hoot beat the throw for an Inside the Park Home Run which won a tremendous contest.

All their lives veteran Briggs Stadium bleacherites will claim that no man in baseball history, not even Ty Cobb, ever circled the bases so fast as did inspired Hoot Evers on that inspired night of June 23, 1950.





Here are two of the five air return fans, each powered with 15 hp Wagner Motors.

Chances are, you have...some 133,000 air travelers pass through this handsome Municipal Airport each month. And, chances are, you've been impressed with the clean, soaring architectural lines of the building and with the clean, fresh, always comfortable atmosphere.

The job of efficient air movement for this 50,000 square foot building is handled by five air supply fans and five air return fans—all driven by Wagner electric motors...five 40 hp motors for air supply and five 15 hp motors for the air return fans. Their quiet, efficient operation in this application is typical of the service record of Wagner motors in millions of applications all over the nation.

Whatever your motor requirements may be, Wagner can supply a standard motor or build a special motor to fit your need. Constant research and development have kept Wagner up front in electric motor design for more than 65 years—made the name Wagner one you can trust in choosing motors for your plant or for your product. Call your nearby Wagner field engineer for an engineering analysis of your next motor application. There are Wagner branches in 32 principal cities.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES WH59-2

Wagner Electric Corporation

6441 Plymouth Ave., St. Louis 14, Missouri.

Display Offers Economy, Dignity

St. Louis Distributor's Carnival Shows Products to Customers and General Public

THE WHOLE FAMILY attended the "Carnival of Air Conditioning & Heating" put on by Marco Sales, Inc., distributor of Carrier products in the St. Louis area. Programs on the three days changed to appeal to electric utility salesmen, architects, consulting engineers, building owners and managers, dealers, and finally, the general public.

* * *

ST. LOUIS — A three-day carnival, staged by the distributor in a tent and pavilion on the outskirts of St. Louis, introduced the 1959 line of Carrier air conditioning and refrigeration equipment to dealers, representatives of the electric utility and consulting engineers, contractors, and finally the general public.

Marco Sales, Inc., Carrier distributor, planned the affair, which was held in a relaxed atmosphere enjoyed by guests and their wives and children. Kenneth A. Roffmann, Marco president, set up an equipment display in a 70 by 30-ft. tent erected by a contractor in a large picnic grounds rented from the Creve Coeur Country Club.

Nearby was a sizeable building which Roffmann and his aides conducted sales meetings while wives and children of guests played games for prizes and had refreshments in the basement below.

The event was well supported with newspaper and radio ads. On Friday, the first day, more than 200 architects, engineers, building owners and managers, hospital and hotel administrators, and school board members attended, along with salesmen for the local utility.

Three separate lecture sessions were held, each stressing residential, commercial, or heat pump.

Saturday was a special "Dealer Day" with refreshments and prizes for the whole family. Sunday from 11 a.m. until 8 p.m. Marco was host to the public, drawn by a radio and newspaper campaign. Thirty good leads were obtained for dealers.

Roffmann says. "We concluded that the tent type of display is very practical and does not at all detract from the dignity of the products. There is economy in serving picnic style sandwiches and soft drinks, and this is an excellent way to become better acquainted with customers.

"The set-up lends itself to inviting the public, and, with half a break, the business obtained through this one phase of the show can go a long way toward paying for the whole affair."

TENT DISPLAY of Carrier equipment ranging from ½-hp. portable room air conditioner to 120-hp. hermetic condensing unit drew heavy attendance all three days of meetings held by St. Louis distributor of Carrier products, Marco Sales, Inc.

PHCIB Elects Halket To Board of Directors

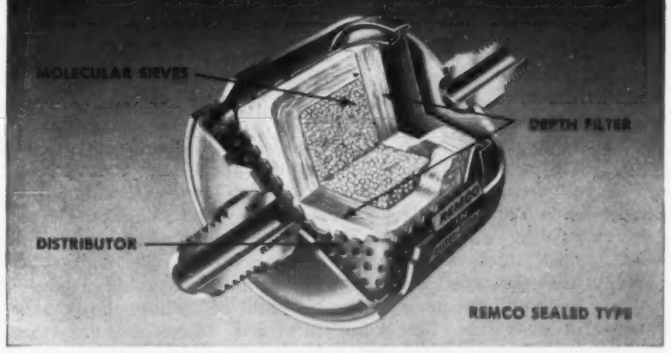
CHICAGO — The election of W. T. Halket as a member of the board of directors of the Plumbing-Heating-Cooling Information Bureau was announced by Howard L. Spindler, bureau president.

Halket is director of marketing, Permaglas Div., A. O. Smith Corp., Kankakee, Ill.

REMCO

MOLECULAR SIEVE FILTER-DRIERS IN

½ thru 40 tons



Only Remco offers so wide a selection of sizes and types

Fast-acting Molecular Sieves keep system moisture concentration to 10 ppm or lower even at 140°F, and hold acid to far below dangerous corrosion limits. Massive depth filter removes all scale, sludge and carbon as small as 10 microns. Remco Filter-Driers work equally well in the hot machine compartment or the refrigerated space. U/L Approved, working pressure is 500 psi; minimum bursting pressure, 2500 psi.

Replaceable Cartridge Type

Adapter Type with moisture-liquid-indicator adapter fitting

SEALED and REPLACEABLE CARTRIDGE TYPE Filter-Driers are available in ½ thru 40 tons, with ¼" thru 1⅝" flare or sweat connections.

ADAPTER TYPE Filter-Driers, ½ thru 12 tons, connect easily to Remco adapter fittings which are installed permanently in line. Adapter fittings have ¼" thru ⅝" flare or sweat connections; available with integral liquid-indicator or moisture-liquid-indicator.

All Remco Molecular Sieve Filter-Driers and adapter fittings have full refrigerant flow. Ask for them at your local refrigeration wholesaler's, or write for Bulletin MS-1. Remco, Inc., Zelienople, Pa.

REMCO

REMCO REFRIGERATION COMPONENTS: FILTER-DRIERS & ADAPTER FITTINGS • CHECK VALVES • MOISTURE & LIQUID INDICATORS RECEIVER-DRIERS • SAFETY DEVICES • FROST-TITE FLARE NUTS

Don't omit the essential ingredient in selling...

Most prospects need their cash reserves and usual lines of credit for current operation. Make it easier for them to sign on the dotted line by including financing arrangements. COMMERCIAL CREDIT'S Refrigeration Plan has become an essential part of the proposal of so many refrigeration and air conditioning companies.

COMMERCIAL CREDIT'S Refrigeration Plan is tested by time and experience in handling the financing for thousands of commercial installations. Let us show you how COMMERCIAL CREDIT'S experience and know-how can save you time and money . . . and help you close sales with less delay. Telephone the nearest COMMERCIAL CREDIT office or write COMMERCIAL CREDIT CORPORATION, 300 St. Paul Place, Baltimore 2, Md.

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AIR CONDITIONING HEATING & REFRIGERATION NEWS

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'The Conscience of the Industry'

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VOLUME 87, NO. 10, SERIAL NO. 1,580, JULY 6, 1959

They'll Do It Every Time

by Jimmy Hatlo

NEX' YEAR WE OUGHTA JUST HAVE PROFESSIONAL ENTERTAINMENT··· DILLBERRY LAID AN EGG AS EMCEE··· AND WE OUGHTA HOLD IT IN A BIGGER HOTEL···
YEAH···AND NEX' YEAR WE SHOULD CUT OUT THE SPEECHES ALTOGETHER···AN' THE BAND DIDN'T PLAY LONG ENOUGH···
THEY HAD THEIR CLUB DINNER LAST NIGHT···THEY'LL BE REHASHIN' IT ALL WEEK NOW···
WONDER IF THEY TALK ABOUT THEIR JOBS AT THE DINNER···THEY DON'T WORRY ABOUT 'EM HERE!
THE FOOD WAS AWFUL···THE ROOM IS THE WRONG SHAPE··DOWN WHERE I WAS YOU COULDN'T SEE ANYTHING···
DILLBERRY AIN'T IN YET···HE WON'T REMEMBER IF HE HAD A GOOD TIME OR NOT····
HOLDING THE WAKE FOR THE CLUB SOIREE THE WHOLE WEEK AFTER···

Automotive Air Conditioning Continues To Break Records

RIGHT NOW automotive air conditioning appears to be the most rapidly rising star in our industry's firmament. Startling both the automobile and air conditioning industries, it has leaped from 40,000 units installed in 1954 to nearly 400,000 in 1958.

Although new car sales dropped 22% in 1958, air conditioned auto sales volume advanced more than 8%!

Some brave pundits predicted in January, 1959, that more than half a million automotive air conditioners will be sold in the current model year. They could be right.

At the same time, wrong-way soothsayers gloomed that independent manufacturers and installers of auto air conditioners, who have been getting most of the business so far, will fall by the wayside eventually.

You can bet wisely that this prediction won't happen. The "independents" are livelier and more confident than ever.

Air conditioned medium-to-expensive *new* car sales have been somewhat surprising this year. Moreover, at-the-factory-equipped air conditioned Plymouths, Chevrolets, and Fords have been in greater demand in the first five months of 1959 than almost anybody expected.

By consolidating private advice from component-suppliers, we can venture that the 1959 model year may chalk up approximately half a million transport air conditioning sales (including trucks, buses, and planes) at a minimum. That's truly a sharply rising sales curve!

Independents have been doing quite well so far in 1959, and most of them figure that they're in business to stay. Reason: they are selling package air conditioners to owners of OLDER cars.

And what a market THAT is!

Apparently scads of conservative private owners (the kind of folk who do not trade in reliable good models for higher tail fins every two or three years) for some unappraised reason *do* want air conditioning when they ride to work or out into the countryside for pleasure.

Returned guarantee cards received by compressor manufacturers, who sell to independent automotive air conditioner installers, prove this point amazingly.

The great bulk of these returned postcards (which list make and model-year of the auto) reveal that said buyers of transport cooling own three-year-old Chevvies, five-year-old Plymouths, and even eight-year-old Buicks.

They'd rather be comfortable than stylish! Somehow, that makes sense.

Fleet owners are excellent customers, also, because the air conditioned car is a great boon to salesman efficiency and tourist comfort and happiness.

Drive-yourself rental auto firms comprise another growing market for obvious promotional reasons—especially in torrid or humid resort areas such as Florida, Texas, and Arizona.

Comparatively few independently produced automotive air conditioners are installed in brand new cars. That's why this "sleeper business" has gravitated toward refrigeration firms from a service standpoint.

Automotive dealers, in general, don't want to bother with used-car applicants for air conditioning. In fact, the job of installing and servicing automotive air conditioners *per se* is a headache and a nuisance as far as many of them are concerned. So they are happy to leave it to refrigeration and air conditioning specialists.

Here's a very human sidelight: Owners of air conditioned automobiles get awfully riled up when anything goes wrong with the cooling unit. They have been spoiled by their room air conditioners and household refrigerators!

The latter run for years and years without trouble. Why, then, they reason unreasonably, shouldn't the cooling machine in their automobile do likewise?

Impatient drivers of air conditioned vehicles don't take into account the especially indigenous problems of vibrations, road shocks, seal troubles, and other screwies peculiar to mobile air conditioning.

Incidentally, truck operators who have air conditioned their drivers' cabs take on similar dilemmas. Hoffa's men also have been "spoiled" by their previous trouble-free experience with stationary refrigeration in warehouses and in refrigerated food trucks.

Even so and notwithstanding, the surprising strength of "the old car" market augurs well for the future of this newest branch of the air conditioning industry, and for the stake of the air conditioning business itself in the latter's contribution to consumer awareness of air conditioning as a positive value.

With the promise of excitingly redesigned 1960 automobile models, next year could be real great for the air conditioned *new car* market. If you aren't getting a piece of this installation or service business now, Mr. Subscriber, make plans!

LADY OF LITTLE FAITH STUDYING HEATING EQUIPMENT TO AVOID ANOTHER DISAPPOINTMENT

Acme Industries, Inc.
Jackson, Mich.

Editor:

Knowing of your keen interest in industry self-improvement, thought you might enjoy this copy of a letter we received a couple of days ago.

There's certainly not much doubt about the impressions that someone in our business has left with this lady.

H. W. SMITH,
Adv. & Sales Prom. Mgr.

Dear Sirs:

I am writing you directly because sometimes dealers do not have all the information from all the companies in one field or you may just get hold of a stupid uninformed salesman.

I have bought an older and larger home and lived through one miserable winter with a most unsatisfactory heating system. I'm disgusted with my heating bills and the poor operation of the system. I'm going to replace it completely and I also want to install air conditioning.

That's why I'm writing to you. I DON'T WANT TO BE DISAPPOINTED AGAIN IN A HEATING SYSTEM particularly after going to the expense of installing a new one.

I went to the library and told them that I wanted to know how to get in touch with manufacturers of heating and air conditioning equipment who are reliable. I got your address from a large book there.

Now what I want is this. Please send me all the literature and information you have on your equipment so that I can study it all through and make up my mind.

I know this may sound like a nuisance but I figure that no one knows as much about their equipment as the people who make it and these days you can get hold of awfully dense people in stores. Thank you very much for helping me.

Handy Way to Subscribe

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Keep up-to-date on what's going on in your industry. You'll see action weekly in AIR CONDITIONING, HEATING & REFRIGERATION NEWS. Covers latest news and gives you top how-to-do-it reports on residential, commercial, and industrial air conditioning, heating, and refrigeration for contractors, dealers, consulting engineers, distributors, servicemen, and manufacturers. Read the industry's only newspaper every week—you'll profit by it—only $6.00 per year, 52 issues (U.S. and Canada). Foreign: $10 per year.

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City..... Zone..... State.....

IMPORTANT: Company's Type of Business.....

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from
the
Frozen
North
comes

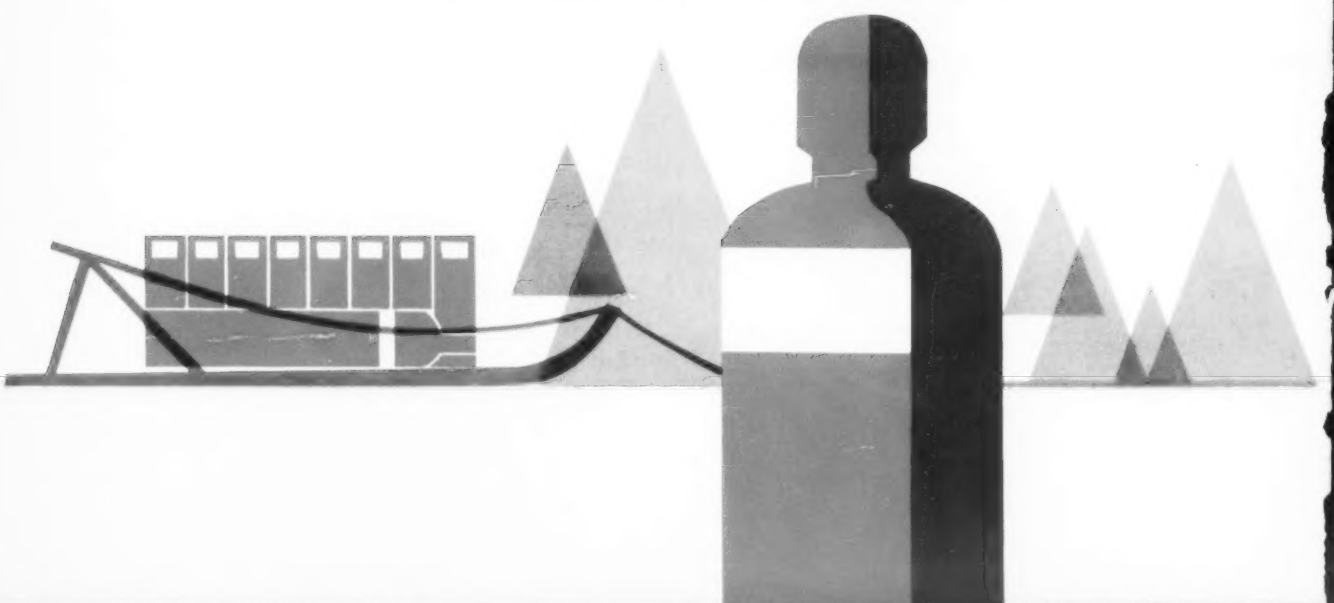
UCON IKE

The most fabulous refrigeration expert of them all!

Meet
UCON IKE

Here's Ucon Ike, representing new Ucon Refrigerants. He's a friendly fellow, a helpful guy who really knows refrigerants (it gets mighty cold in the far North). He's resourceful, too... willing to try new ways of doing things. (Example: who but Ucon Ike ever tamed a moose before? Discovered one moose-power far outpulls eight dogpower!) Take a good look at him, because he'll soon be one of the most familiar faces in the industry.

We think you'll enjoy knowing Ike. He *is* Ucon Refrigerants– America's newest, top-quality refrigerants now available to you. He stands for the *people* who go with Ucon Refrigerants... people who know and care about your problems... people who make the difference. So, remember Ucon Ike when you think of Ucon Refrigerants – made by Union Carbide Chemicals Company. Ansul Chemical Company is exclusive sales agent.



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UCON Refrigerants—
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5 top-quality grades
Full range of unit sizes
Color-coded at the top
Personalized service

UNION CARBIDE product

Ucon BRAND refrigerants

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Exclusive Sales Agent to Air Conditioning and Refrigeration Wholesalers
ANSUL CHEMICAL COMPANY, Marinette, Wisconsin

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Commercial Air Conditioning

Business as Usual at Sterns

Dept. Store Installs 1,300 Tons of Cooling

HAT SALES are made while air conditioning equipment is installed a few feet away. Stern's Better Millinery department, having covered the dust-proof shelter (large blank wall with double door in center of photo) with pink paper, enjoys business as usual while a Worthington 9,350 c.f.m. air cooling unit is hung inside. With installation completed, department has full use of floor space, since the compact air cooling unit is suspended from the ceiling.

* * *

NEW YORK CITY—It was business as usual at Stern Bros. department store on New York's busy 42nd St. during installation of a 1,300-ton capacity air conditioning system.

Part of a complete-store-wide rejuvenation program symbolized by the motto "The New Sterns," the present work included installation of two steam-operated, 650-ton refrigeration units in an unused sub-basement boiler room, four Worthington air handling units per floor on the five main sales floors, and 5,000 lineal feet of duct, mostly in sales areas.

Erection of ductwork and the air handling units required construction activity directly over or adjacent to sales areas.

This was accomplished without disrupting sales activities or interfering with customers by erecting temporary dust-tight walls around each construction area. Less than 900 sq. ft. of selling area was preempted at any one time, and customers, for the most part, were unaware of any construction activity.

Work planned for the near future includes extending the air conditioning system to all sales and work areas of the 50-year-old, eight-story building, beginning with the employes' cafeteria this summer.

The system was designed and installed by Spencer Air Conditioning Co., Minneapolis.

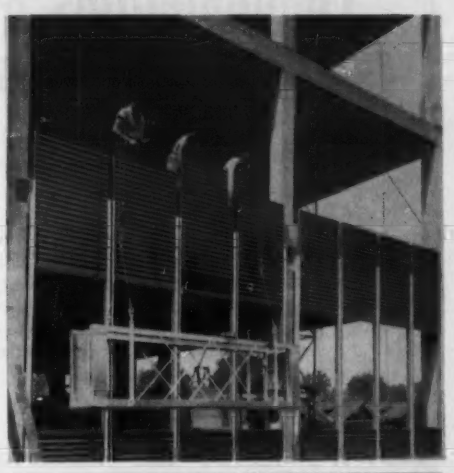
The two steam turbine driven centrifugal refrigeration units manufactured by Worthington were lowered to the sub-basement through a freight elevator shaft, by-passing all sales areas.

Parts for the water cooling tower were hoisted directly to the roof from the street level, while chilled water and condenser water pipe has been located in storerooms and stairwells.

Each of the air handling units, which vary in capacity from 6,500 to 17,600 c.f.m. is located near a window for each access to outside air. In addition to cooling coils, every air handling unit has provision for heating coils which may prove desirable in the future.

Steam for operating the refrigeration units is supplied from under-the-street mains.

Aluminum Louvers Supply Air For Conditioners



WORKERS INSTALL aluminum louvers during construction of the new office building for the Standard Life Insurance Co. of Indianapolis. The surfaces are protected from weathering by the application of a protective coating of butyrate lacquer. Besides serving as air conditioning intakes, the louvers function as an essential design component of the curtain-wall exterior. Where no air ducts were necessary, sheet panels blocked off the inside of the louvers.

SEND FOR REPRINTS

"ELECTRICAL CHARACTERISTICS OF PACKAGED AIR CONDITIONING UNITS."

Only 25¢ each.

For your copy, clip this ad and mail with name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

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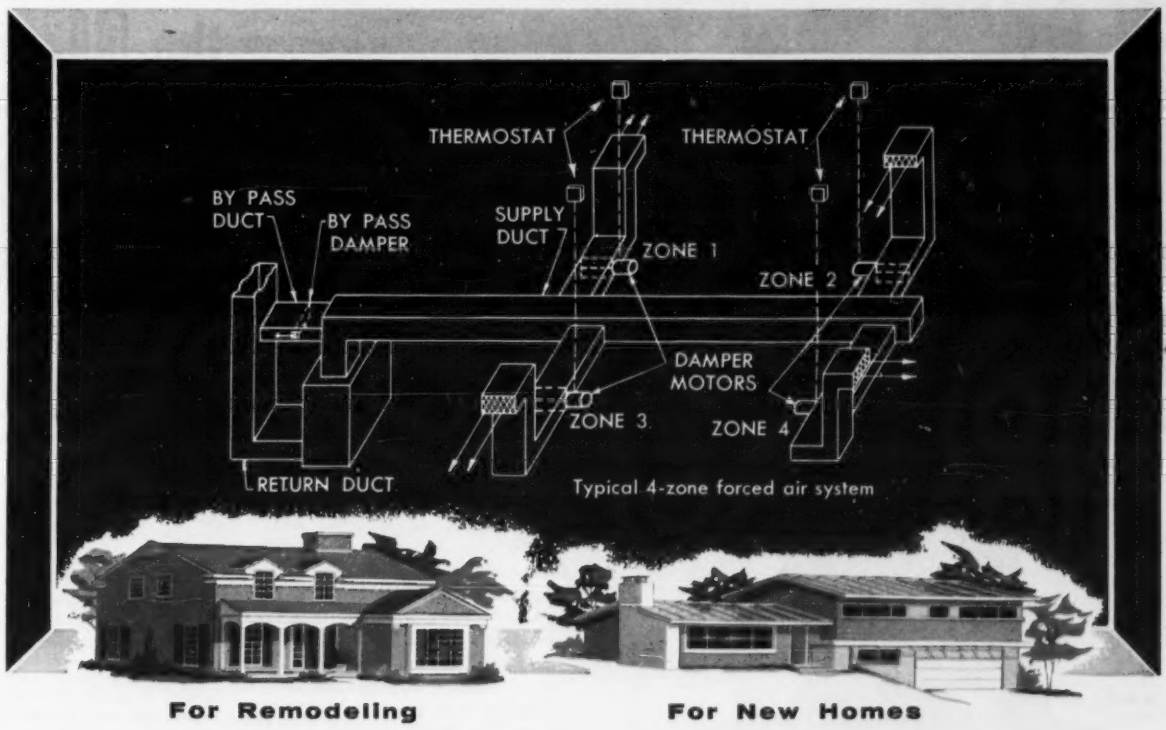

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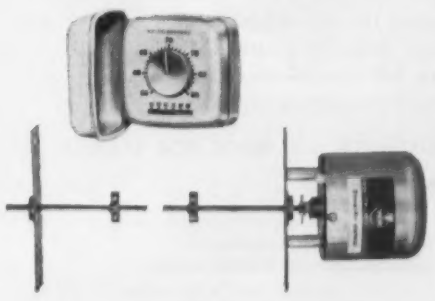
Home owners are beginning to demand the comfort of zoned heating. Here's a new, fast growing market that will make handsome profits for those alert dealers and contractors who capitalize on the advantages of White-Rodgers "Zone-Air" . . . which provides reliable, customer-satisfying zone control at a price easy to sell.

Zone-Air increases home comfort; raises system efficiency; boosts property value . . . yet lowers fuel bills; keeps zoning installation costs down with simplified design and low-voltage wiring.

Cash in on these extra profits . . . offer Zone-Air control on all the jobs you install.

Write for Bulletin R-1637 giving complete information.

HOW IT WORKS . . . an attractive thermostat in each zone controls a silent motorized damper installed on the air supply to its particular zone. Whenever the thermostat calls for heat, the motor opens the damper—closes it when the right temperature is reached. Where required an "equalizer" by-pass damper is available to stabilize air velocities.



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212

Fundamentals of Air-Moving Systems

(2) Selecting Fans, Blowers for Top Performance

By L. C. Lindstrom, Air Impeller Div.
The Torrington Mfg. Co., Torrington, Conn.

The first two articles in this series (AH&RN, March 30 and April 6, 1959) described how an air-moving system works and related system requirements to impeller characteristics in pressure-flow performance curves. Knowledge of the behavior of air-moving systems and familiarity with performance curves has great practical value in selecting impellers for moving air in such equipment as central cooling systems, package air conditioners, and unit heaters.

There are so many models and makes of blower wheels (Fig. 1) and fans (Fig. 2) today that the equipment designer or installation contractor should establish a step-by-step system for picking the best impeller for the job. A logical selection procedure can avoid a lot of thumbing through manufacturer's catalogs and, most important, can eliminate serious mismatches between impeller and system.

FIGURE 1

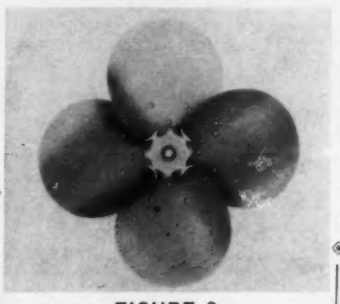


FIGURE 2

HELP FROM IMPELLER SPECIALISTS

The designer or installer should not feel that he alone must handle the final detailed specifications on a fan or blower wheel. Application engineers are assigned by impeller manufacturers to working with users to insure the best possible performance of both their own products and their customers' products. The user can save himself a good deal of time and trouble, however, if he is first able to determine himself the proper type of impeller and the particular model or models which seem to deliver the desired air flow in the known system and within the existing space limitations. He is then in a position to consult the impeller manufacturer with all the required application information on hand and a good idea of the impellers which seem to be right for the job.

The manufacturers' specialists will be particularly helpful in analyzing the relative installed cost of several appropriate impellers and in checking for any design angles which might later be troublesome.

After the selected impeller has been installed and an air flow test is run, performance may be below expectations. This situation occurs most frequently when the pressure drops in the flow systems have been inaccurately determined or when there is a last-minute change in the system. With the advice of the impeller specialist, it is then a matter of replacing the impeller initially selected or making a change in the system (or both).

PERFORMANCE REQUIREMENTS

As in selecting any component, all pertinent operating specifications and limitations on the fan or blower wheel must first be determined. In air-moving systems, these requirements are usually concerned with both performance (the amount and distribution of air flow) and space (volume available and direction of air flow).

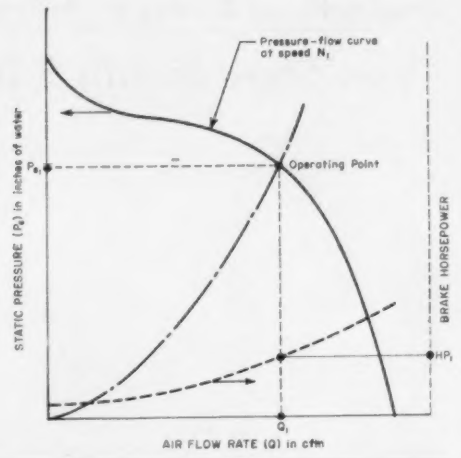


FIGURE 3

The fundamental performance requirements of the system are represented by the operating point on the dot-dash system resistance curve in Fig. 3. The desired flow rate Q_1 will be obtained by overcoming a static pressure drop P_{s1}. Although it is unlikely that the impeller specifier will know the entire system resistance curve for a particular air-moving unit, he should know the values of Q_1 and P_{s1} at the point of operation.

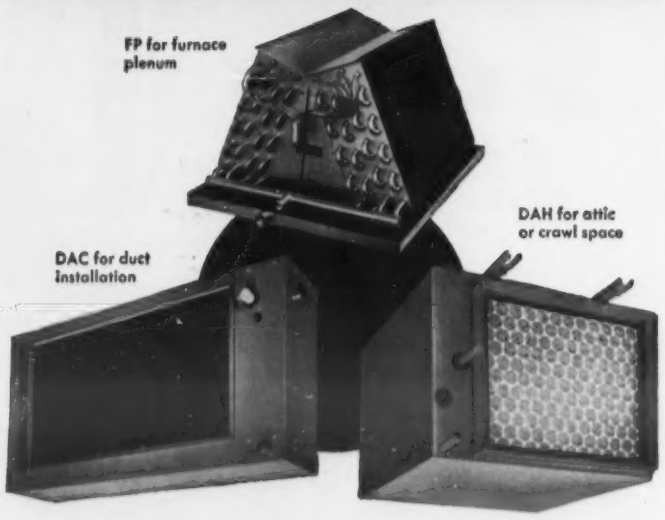
The air flow rate Q_1 is usually

CASH IN on the SIZZLING HOME COOLING MARKET with

LARKIN

AIR CONDITIONING COMPONENTS

(2, 3, 4 and 5-ton capacities)



It's time you turned the sizzling home air-conditioning market into a piece of cool profit for yourself. Get your share of these jobs with LARKIN Air Conditioning Components—quality units priced to give you a competitive advantage.

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- 2, 3, 4 and 5-ton capacities
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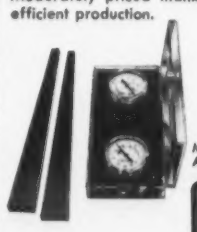
...and it costs less!

Serviceman "Super-Heat" Kit

Contains two attractive, polished brass, 2½-inch thermometers, graduated —40° to +65° F. Also two insulating wrappers for easy bulb attachment and to insulate bulbs from ambient temperature (vital to testing accuracy). Thermometers, wrappers and manuals compactly held in durable 3" x 8" x 1¼" box with handy hinged cover. Moderately priced thanks to efficient production.



Your setting of the expansion valve can be no more accurate than your reading of superheat. How do you read it?

The Marsh way is the accurate way...the lowest cost way, too, when you compare these long-lived thermometers with the breakable glass tube kind.

Instead of those hard-to-read, hard-to-use glass tube thermometers, a handsome pair of distant reading dial thermometers with small bulbs easy to attach at exactly the right place. Widely spaced markings in working area assure far greater reading accuracy than is possible with glass tube thermometers... guaranteed accurate within one division plus or minus.

Put the bulbs where they belong; the dials where they can be seen and compared...and you're "in business." Manual in every kit tells how to get best results. Write for facts or

See Your Wholesaler
MARSH INSTRUMENT COMPANY
Division of Colorado Oil and Gas Corporation
Dept. D, Skokie, Ill.
Marsh Instrument & Valve Co., (Canada) Ltd., 8407 103rd St., Edmonton, Alberta. Houston Branch Plant, 1121 Rothwell St., Sect. 15, Houston, Texas.

MARSH Refrigeration Instruments

SAVE

DRYERS
- 2 cu. in. of PA-400 Silica Gel
- Complete acid removal
- Low end point drying

STRAINERS
- Almost 2 sq. in. of 150 mesh monel

Special design makes installing, adjusting, and servicing a "one-stop" job!

CAP TUBES give perfect results "as is" for all units to ⅓ H.P., freezers to ⅓ H.P., and water coolers to ¼ H.P.

FOR BEST RESULTS specify No. 698-S2/F2 Strainer-Cap tubes and No. 699-S2/F2 Dryer-Cap tubes.

SPECIAL COMBINATIONS are available for use up to ¾ H.P. for R-12 and R-22.

Write for information to- WABASH CORP. / 2300 S. Western Ave., Chicago 8
EXPORT DEPT.
13 E. 40th St., New York 16, N.Y.

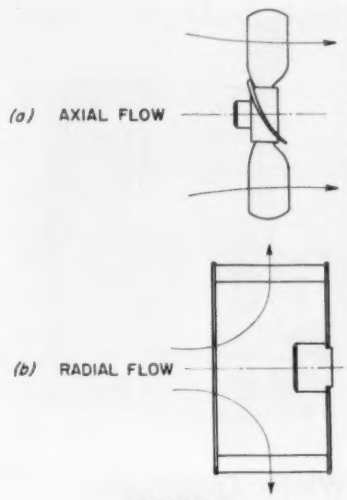


FIGURE 4

given as a design objective for the equipment, while the static pressure P_{s1} may be known either as the result of experience with a similar system, a test run with a standard impeller in the actual system, or rough calculations with the help of standard pressure-loss data and reference manuals.

The required, or preferred, impeller speed and available horsepower may also be given as initial conditions. A particular motor speed may already have been specified for the operation of other components of the unit, or, more likely, the lower cost of a standard motor in direct drive may be desirable.

Although special drive motors may be specified for volume production at little additional cost, it is usually good practice to select a standard power unit. Speeds obtained with two, four, and six-pole split-phase motors and comparable shaded-pole motors are frequently specified. Higher motor speeds are generally indicated when compactness is particularly important; lower motor speeds are usually used to obtain quieter operation.

PHYSICAL REQUIREMENTS

Space available, both its size and shape, and direction of the impeller intake and discharge are space requirements which can affect impeller selection. Flow is continuous from intake to discharge in the axial impeller in Fig. 4(a). On the other hand, the blower wheel in Fig. 4(b) discharges air at right angles to its intake.

If the question of flow direction is not important, it is possible that the specifier may not know whether the best type of impeller is a propeller fan or blower wheel in new equipment. In revising lines of standard equipment or in replacing an impeller in an existing installation, however, the best or necessary type of impeller is probably known from the beginning.

Because space is at a premium in most air-moving units, even in today's central heating and cooling systems, there are few impeller applications where the over-all dimensions of the impeller unit are not limited in some way. Therefore, the diameter and width of a blower wheel, including the housing or scroll dimensions, must be considered with respect to the space allotted. In axial impellers, blade-tip diameter and total axial length of the propeller fan and motor may be critical.

(To Be Continued)

Imperial Appoints 3 Divisional Sales Mgrs.

CHICAGO — Appointment of three new divisional sales managers has been announced by The Imperial Brass Mfg. Co.

T. A. Fuite, formerly sales representative in the Chicago area, has become sales manager-Central Div. J. A. Norris, formerly sales representative in the Los Angeles area, is now sales manager-Western Div. H. W. Pearson, formerly sales representative in Texas and Louisiana, has been named sales manager-South Div.

White-Rodgers Names James A. Rodgers, Jr.

ST. LOUIS—Appointment of James A. Rodgers, Jr. as manager of the Technical Sales Div. was recently announced by the White - Rodgers Co.

J. A. Rodgers

Rodgers was formerly a technical sales engineer for the company. In his new position, he will be in charge of new product specification planning for future products approaching development stage.

In addition, the division coordinates and distributes technical product information for use by the company field sales organization and acts in a product advisory capacity to top management.

Frankell Moves To Larger Plant In Jersey City

JERSEY CITY, N. J.—Frankell Mfg. Co., manufacturer of the patented Frankell hermetic compressor opener, announces its removal to a modern, larger plant at 862 Newark Ave., Jersey City 6, N. J.

Frank Lowitz, president of Frankell, stated that this move was necessary because of a great increase in business during recent months. This plant offers Frankell improved production facilities which will increase its capacity to keep pace with current demands and meet the needs for future growth, it was stated.

Frankell was formerly located at 1074 Home St., New York City, according to the firm's announcement.

Why try to kill algae like this...

USE CALGON® ALGAECIDE

Calgon's Algaecide kills slime and algae fast — helps keep cooling water system operating at top efficiency. Get a supply from your Refrigeration Wholesaler today.

CALGON COMPANY

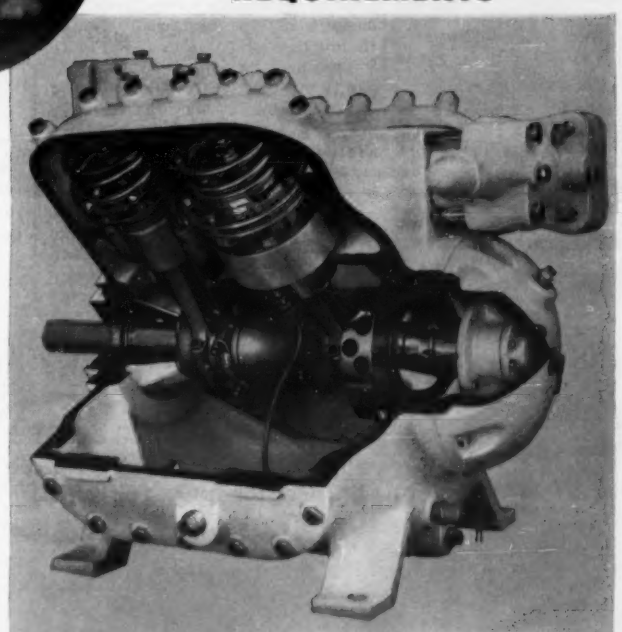
DIVISION OF HAGAN CHEMICALS & CONTROLS, INC.

HAGAN BUILDING, PITTSBURGH 30, PA.

In Canada: Hagan Corporation (Canada) Limited, Toronto

quiet *vibrationless*

...A NEW COMPRESSOR TO MEET TODAY'S REQUIREMENTS



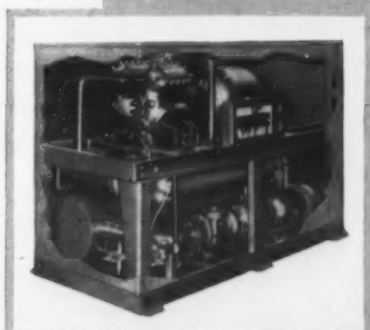
B&G Compressors are *not* adaptations of designs originated 20 years ago—they are completely new in conception, engineered to establish higher standards of performance. Foremost of their many features is quiet, vibrationless operation—and here B&G Compressors have no equal. *Any vibration is no greater than that of a good electric motor.*

This is concrete evidence of quality! It indicates the precision manufacture of a basically superior design. B&G Compressors have fewer parts, present fewer maintenance problems. All units have *one* bore diameter—a few interchangeable parts will service them all.

B&G Compressors can be equipped with multi-step capacity control systems. Standard equipment includes gas and oil equalization ports, magnetic plugs and oil sight glass.

All these things add up to greater efficiency—greater value per dollar. Remember, too, that all major parts of B&G "package" units are made and guaranteed by Bell & Gossett Company.

B&G Condensing Unit
An achievement in compact efficiency, featuring interchangeable vital parts. 7½ through 150 tons.



B&G Package Liquid Cooler
Completely integrated and assembled. Everything included, no extras to buy. 7½ through 150 tons.

Send for complete file of specifications and application data on B&G Air Conditioning and Refrigeration equipment.

A COMPLETE LINE OF REFRIGERATION AND AIR CONDITIONING COMPONENTS

BELL & GOSSETT COMPANY

Dept. PU-47, Morton Grove, Illinois

Canadian Licensee: S. A. Armstrong Ltd., 1400 O'Connor Drive, Toronto 16, Ontario

Command-Aire Offers Roof-Mounted Conditioners

● Roof-mounted air conditioners are being offered by the Command-Aire Div. of Texas Products Mfg. Co., Dept. AH&RN, P. O. Box 571, Waco, Texas.

"These units are constructed with heavy bases of steel channels and surrounded with tubular steel in a welded one-piece frame construction," the company pointed out. "They are housed with heavy gauge galvanized sheet steel and finished with a durable two-coat protective enamel.

"The units are completely factory assembled and wired with only gas, electrical, and thermostatic connections needed. Control is accomplished by using Minneapolis-Honeywell T 87A thermostats with Q405 sub bases, allowing the customer to select any condition desired."

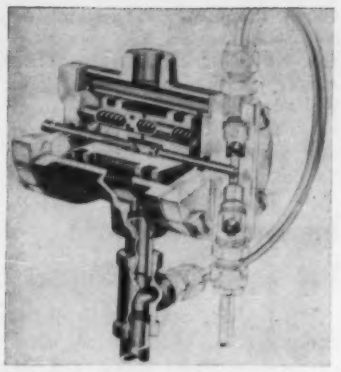
No ductwork is required, with the unit needing only a single opening in the roof and ceiling and connection to a single diffuser, according to the firm. This unit is built in 7½ and 10-ton cooling capacities with heating capacities from 100,000 to 250,000 B.t.u., and available for cooling only, it was stated.

Baseboard Electric Heating Units Bowed

● A new line of baseboard electric heating units has been introduced by Air Conditioning Div. of Westinghouse Electric Corp., Dept. AH&RN, Staunton, Va.

The line features a three-way air flow design which carries air through the front and rear of the unit. This is said to provide full heating efficiency and keep the surface of the unit cool enough to touch.

The heating units have a capacity of 250 watts per foot and are available in sections measuring 2, 4, and 6 ft., it was stated. Corner sections and "blank" sections which may be cut to any length are available for continuous assemblies. Seven inches high, and 2⅝ in. deep, these sections are easily installed either surface mounted or recessed, the company said.



Myers Pump Claims Extreme Accuracy

● A new, "low cost" positive displacement chemical feed pump for water purification and treatment is a new development of The F. E. Myers & Bro. Co., Dept. AH&RN, Ashland, Ohio.

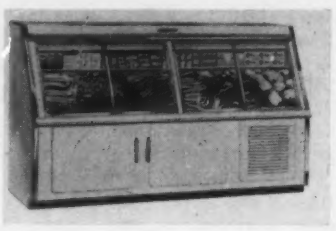
The pump, once regulated, "is extremely accurate in automatically maintaining the proportion of chemical solution to the water flow," the company said. "The number of strokes per minute is directly proportional to the number of gallons per minute being treated."

This unit weighing 5½ lbs. will chemically treat flows up to 3,000 g.p.h., it was stated. The pump is recommended as a chlorinator or polyphosphate feeder wherever needed; for the home water supply, for the farm, or for commercial process water such as in the air conditioning field.

Want More Details?

ADDITIONAL details on products that are described on these pages may be obtained by writing the manufacturer at the address given in each What's New story.

Tell him: "AH&RN sent me!"



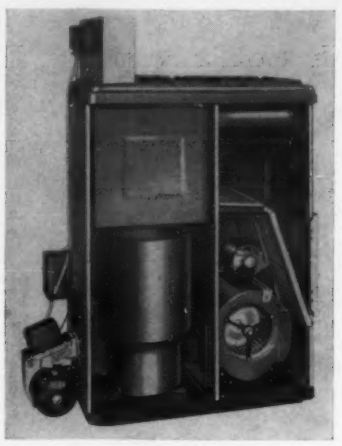
McCray Announces New Double-Duty Case

● A self-contained, double-duty produce and dairy case has been announced by McCray Refrigerator Co., Inc., Dept. AH&RN, Kendallville, Ind.

This new model, which will be available in 8 and 10-ft. lengths, has sliding glass service doors which can be removed during heavy shopping periods. It is particularly adaptable in the small store or in an open location where it is essential to protect the product from dust and air currents, the company said.

"The condensing unit is a light ½ hp. in the 8-ft. case and a heavy ½ hp. in the 10 ft.," it was stated. "Gravity coils designed for extra high humidity are located in the top of the case and across the back wall of the storage compartment. The upper coil has a drip pan which is removable in sections to contain the defrost water or to let it drip on the produce. Fluorescent lights highlight the display and a mezzanine shelf furnishes added display area."

These cases are compact and yet feature adequate display and plenty of accessible storage in a limited floor space. They are sturdily built.



Winter Conditioners Available In 3 Sizes

● Three new sizes of factory assembled and wired "Luxaire" oil-fired winter air conditioning units have been announced by The C. A. Olsen Mfg. Co., Dept. AH&RN, Elyria, Ohio.

The units have heating capacities of 84,000, 95,000, and 112,000 B.t.u.h. at the bonnet, and are rated in accordance with the U. S. Dept. of Commerce Commercial Standard No. CS-195.

All three sizes are available either with the burner and controls exposed, or with a built-in vestibule which has a full-length, hinged door that conceals the burner and controls.

A feature claimed for the furnaces is quiet operation, made possible by the combination of a round, heavy gauge steel combustion chamber with factory-installed refractory firebox lining.

if YOU WANT THE VERY BEST...

Specify HASTINGS GAS UNIT HEATERS

No Other Heater Has All These Quality Features

Fan — Blower — Duct Models

25,000 to 500,000 B T U
10 Year Warranty
Aluminized or Stainless Steel
Optional Dual-Fuel
4 Way Air-Distribution Louvers
"Easy-Balance" Hangers
Write For Literature

HASTINGS AIR CONTROL, INC.
OMAHA 5, NEBR.

You Cannot Afford To Be Without This Equipment

HASTINGS HOIST-IT

THOUSANDS OF USERS
Save Money • Time • Trouble
With the "HOIST-IT" and "CLEAN-IT"

HASTINGS CLEAN-IT

Erect A 4,000 Lb. Unit In One Hour

Two Men Can Raise 4,000 lbs. up to 24 ft.
IDEAL FOR ALL TYPES OF EQUIPMENT
Air Conditioners • Heaters • Blowers
Attic Units • Transom Units

The Answer To
DE-SCALING and CLEANING
Problems

The Only Complete PORTABLE Unit On The Market

Invaluable for Cleaning
ALL TYPES OF CONDENSERS
Also

Coil Surfaces — Coil Tubes
Blower Wheels — Cooling Towers
Air Handling Units — Water Heaters

Features Include

Acid Proof Tank • Pump • Hoses
May Be Used For Pressure or Suction
Jet and Suction Nozzles
Rubber Tired Wheels

Write For Prices and Information
HOIST-IT Bulletin AC-71-H — CLEAN-IT Bulletin AC-71-C

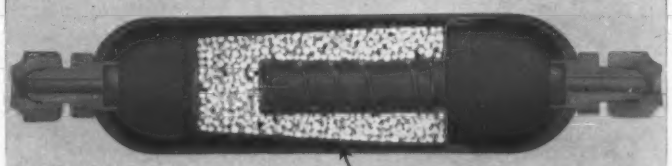
HASTINGS AIR CONTROL Inc., OMAHA 5, NEBR.

KMP MOISTURE MAGNET DRIERS

Now KMP® DRIERS with TRIPLE FILTRATION are 3 Times Better for You!

- NO CARTRIDGES
- NO ADHESIVES
- NO BINDERS

to reduce drying capacity and efficiency



Desiccant Self-Contained in Micro-Mesh Screen

100% SILICA GEL OR MOLECULAR SIEVE DESICCANTS CONTAINED IN MICRO-MESH SCREEN

More than 187 of the leading refrigeration and air conditioning manufacturers use KMP® Moisture Magnet® Driers as original equipment. There's a reason. It's not only the dependability, low cost and efficiency of operation of the triple filtration Moisture Magnets®, but also the manufacturers' assurance that the operation of their product is protected from moisture, foreign particles and pressure drop. This same protection is yours with Kenmore Moisture Magnet Driers.

See the KMP line at your Refrigeration wholesaler.

KMP KENMORE MACHINE PRODUCTS, INC.
LYONS, NEW YORK

Driers • Accumulators • Accumulator Driers • Strainers • Capillary Assemblies

Open Letter to the Industry--

(Concluded from Page 1)

have the price, you can have the order. Think of it! If you have the low price or if you will cut below all other prices, he will give you the order. If this is so, then what is your function? What is your future? You can't possibly "sell" a price.

Your pride says this is ridiculous. You can't really sell price because there isn't anything to sell in the *P-R-I-C-E*.

Salesmanship is the only answer! The law of supply and demand determines who profits and loses. *Demand* is the result of selling an idea to someone that they should buy a product or service and benefit.

Price does not create demand—salesmanship creates demand.

We can all take heart from the automobile industry. The three major low priced auto manufacturers all have the same unit price. But demand for these autos is not equal and the variation is caused by a return to salesmanship. Identical pricing in the auto industry, yet salesmen sell cars on small differences, windshield wipers, door designs, door handles, controls, wheel design, hood and body construction, and even the color of the upholstery. Small benefits, but they are benefits for the buyer.

Let's all stop giving our rightful profits away and start to sell. No group or program can solve our profit problems in our free economy. Our salvation lies in our industry deciding we must all start to sell and then we will make a profit. Stop talking price—start talking benefits and sell them. Your profits will increase.

The man with a P-R-I-C-E has *nothing* to sell. He is doomed to still lower prices because that is all he offers.

Price should be the result of:

P roduct benefits

R ecognition of the economy that made America great

I ndustry perseverance

C onfidence in your company, goods, services and its future

E nterprising salesmanship

D. G. MERRILL, Field Sales Manager

July Climatological Evaluation Chart Gives '57, '58 Ratings for 32 Cities

NEW YORK CITY—The air conditioning sales climate during July 1957 was generally favorable while that for 1958 was generally unfavorable.

Those are the indications found on a climatological evaluation chart covering 32 major cities issued by Weather Trends, Inc., a private weather forecasting and weather recording organization.

* * *

Climatological Evaluation

City	July 1958	July 1957
Atlanta	3	3
Baltimore	3	3
Birmingham, Ala.	3	3
Boston	3	4
Buffalo	3	3
Chicago	2	3
Cincinnati	2	3
Cleveland	2	2
Dallas	3	5
Denver	2	3
Des Moines	1	5
Detroit	2	3
Houston (U)	4	5
Indianapolis	1	2
Kansas City	1	4
Los Angeles	3	5
Memphis	3	3
Miami (U)	5	4
Minneapolis	1	5
New Orleans (U)	3	5
New York City (U)	3	4
Oklahoma City	2	4
Omaha	1	4
Philadelphia	3	3
Phoenix	5	4
Pittsburgh	2	3
Portland, O. (U)	5	2
Raleigh	3	3
Richmond	4	4
St. Louis	2	3
Washington	4	5
Wichita	2	5

Legend: 5, superior; 4, favorable; 3, near normal; 2, unfavorable; 1, poor.

Note: All "ratings" are related to NORMAL conditions based on long-term Weather Bureau records. Data used are from airport weather stations unless (U) is indicated which refers to "urban" or city station.

The July chart reproduced here is the third of four covering the May-August air conditioning sales season. They are printed for whatever value they may have to companies aiming promotional efforts at individual markets.

All ratings are related to "normal" conditions based on long-term U. S. Weather Bureau records.

The numbered ratings of air conditioning sales weather are on an ascending scale: 1—poor, 2—unfavorable, 3—near normal; 4—favorable, and 5—supererior.

On this basis, only six of the 32 major cities covered had a favorable—4 or 5—rating during 1958 and 14 had unfavorable—1 or 2—rating. Only Miami, Phoenix, and Portland, Ore. had superior ratings.

1957 was a different story entirely. Fifteen cities had favorable or superior weather while only three had unfavorable and none poor sales weather. Superior sales climate was found in Dallas, Des Moines, Houston, Los Angeles, Minneapolis, New Orleans, Washington, D. C., and Wichita, Kan.

For Your Reprint Copy

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.
Only 25¢ each.

Automatic Central Heating Units Estimated At 21,232,370—PHCIB

CHICAGO — Automatic central heating units in operation at the end of 1958 are estimated at 21,232,370 of which 50.9% are gas-fired, 43.9% oil-fired, 2.9% stoker-fired, and 2.3% electric, according to the Plumbing-Heating-Cooling Information Bureau.

You don't have to clean out scale like this...

CALGON® ECONOMY POWDERED ACID IS SAFE!

Specially formulated for *safe, low-cost* cleaning of cooling water systems. When economy and safety are prime considerations, get Calgon Economy Powdered Acid from your Refrigeration Wholesaler.

CALGON COMPANY
DIVISION OF HAGAN CHEMICALS & CONTROLS, INC.
HAGAN BUILDING, PITTSBURGH 30, PA.
In Canada: Hagan Corporation (Canada) Limited, Toronto

Thinking of —

- **changing territories**
- **expanding your territory**
- **taking on new lines—**

Check the
CLASSIFIED ADS

Your opportunity may be there.

5-SECOND APPLICATION!
FOR INSULATION ANCHORS and FASTENERS
Use **Stic-Klips®**

- No Surface Drilling
- Quick Fastening
- Strong Positive Bond

Stic-Klips ® are time and labor saving fasteners for attaching insulation, strapping, metal lath wall fixtures, wiring and conduit to curved or flat, metal or masonry surfaces.

Application takes only seconds. All you do is apply a thin coat of Stic-Klip ® adhesive to the base of a Stic-Klip ® fastener with a putty knife. Apply another thin coat as primer base on porous surface area. Place Stic-Klip ® fastener to primer base until adhesive fills holes. Clean off excess adhesive with putty knife.

Write for your application bulletins, Today!

Stic-Klip MANUFACTURING CO
94 Regent St. Cambridge 40 Mass

160 tons of Air-Cooled Freon Condensers, supplied by F. H. Langsenkamp Co., Indianapolis wholesaler, play a major part in one of the industry's largest air conditioning systems at the Indiana Gear Works, Inc.

INDIANA GEAR WORKS

cuts air conditioning maintenance costs 40%

John Kingsbury, Air Conditioning Equipment Co., Indianapolis, solved a costly maintenance problem when he replaced a previous water-cooled system with Krack Air Cooled Condensers. Down time for draining the system, scale removal and general summer and winter overhaul was eliminated. Now with Krack Air Cooled Condensers, the push of a button starts or stops the system any time of the year.

Krack Condensers offer more coil surface to give you lower condenser temperatures and higher mechanical efficiencies. Capacities: 1 to 50 tons.

Send coupon today—for helpful bulletin.

KRACK REFRIGERATION APPLIANCES, INC.
Manufacturers of freon, ammonia, flooded ammonia heat transfer equipment

REFRIGERATION APPLIANCES, Inc., 901 Lake St., Chicago 7, Illinois
Send free bulletin giving all technical details.
Name_____
Firm_____
Address_____
City_____ Zone____ State_____
8850

TECHNICAL CENTER

By Frank J. Versagi, Technical Editor

Instruments In Service Work (4)

Electrical Measurements (2)

While watts can be calculated theoretically by multiplying volts times amps, this calculation does not usually give the actual power consumption of the unit —due to power factor variations. Where it is necessary to know the actual power consumption, wattmeters are called for. If the wattage indicated is out of line and the voltage is within proper range, trouble is indicated.

If the wattmeter shows the unit operating at too high a wattage, the indication is that excessive current is flowing.

If the wattage is too low, less than normal current is being drawn. In one typical use, a low wattage reading on an old refrigerator placed back into use indicated the motor compressor was not working as hard as it should. Pressure check showed low pressure; diagnosis within minutes of start-up: refrigerant leak during storage.

Wattmeters are also directly applicable to capacitor testing—with some companies providing charts to relate wattage to microfarad ratings. Tests of this type permit testing the actual condition of the capacitor, rather than merely telling whether the capacitor is "good" or "bad."

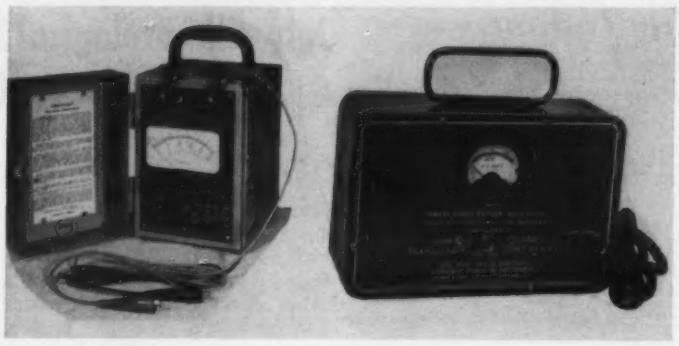


FIG. 6—Examples of specialized instruments designed for particular applications.

As indicated earlier, electrical testing instruments can be adapted and assembled into packages to perform specific functions. Thus the unit at lower right of Fig. 6 is a load-voltage analyzer especially useful in determining quickly the adequacy of an electrical circuit for fractional horsepower room air conditioners. Making this test before installing a room unit can prevent customer dissatisfaction, prevent overloaded circuits with resultant fire hazard

A combination meter with an important function of testing the dielectric properties of insulation on everything from microswitch assemblies to motor and generators is shown at upper left of Fig. 6.

Similarly, there are several assembled packages designed for making the several electrical checks necessary to determine the condition of motor-compressors, relays, capacitors, starting and running currents.

And each of the basic electrical instruments — voltmeters, ammeters, ohmmeters can be obtained in more precise construction for panel mounting in the workshop, rather than for field service.

The heating-cooling serviceman who is just beginning to procure testing instruments for his field work would probably do best to commence with simple electrical testing instruments such as described here. Instructions supplied by the instrument manufacturers, as well as fully detailed test procedures recommended by heating-cooling manufacturers, will make it possible for the serviceman to save many hours in his work week and to diagnose some troubles he has heretofore been unable to solve.

NEXT: PROGRESS REPORT ON THE GENERAL ELECTRIC ELECTRONIC LEAK DETECTOR

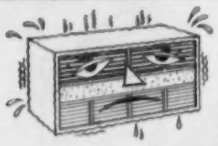
Instrument Suppliers

Typical suppliers of electrical testing instruments such as those described are (2), (7), (13), (15), (18), (29), and (32).

2. Associated Research, Inc., 3758 W. Belmont Ave., Chicago 18, Ill.
7. Bristol Co., P.O. Box 1790 ACR, Waterbury 20, Conn.
13. General Electric Co., Apparatus Sales Div., 1 River Rd., Schenectady 5, N. Y.
15. Heights Air Conditioning Co., 3607 Hildana Rd., Cleveland 20, Ohio.
18. Leeds & Northrup Co., 4907 Stenton Ave., Philadelphia 44, Pa.
29. Pyramid Instrument Corp., 630 Merrick Rd., Lynbrook, N. Y.
32. Simpson Electric Co., 5200 W. Kinzie St., Chicago 44, Ill.

Ansul Declares Dividend

MARINETTE, Wis.—A quarterly cash dividend of 25 cents per share has been declared by Ansul Chemical Co. It will be payable July 15 to stockholders of record July 1.



In the majority of cases . . .

WRAP UP RAC SERVICE IN A SINGLE CALL

by carrying a

FASCO R51A ROOM AIR CONDITIONER REPLACEMENT MOTOR

The One Motor That Perfectly Meets Most Replacement Needs

No matter what make or size motor you find "down" on your next room air conditioner service call, you can be reasonably sure that Fasco R51A will match it. The ideal replacement motor for most room units in service today, the versatile R51A handily doubles for a variety of specific motors. Having one along on service calls usually saves valuable time now wasted chasing same name substitutes and eliminates time-consuming call-backs.

EXCLUSIVE "IN STOCK" PLAN AND 24 HOUR SERVICE . . . DIRECT FROM WAREHOUSE

Saves Inventory and Stocking Problems, Too!

CHECK THESE R51A SPECIFICATIONS...

1. Two speeds—1050* R.P.M. in high, 850 R.P.M. in low, depending on lead connections made.
2. 1/10 H.P.**—can be used to replace motors from 1/15 to 1/10 H.P. When used on loads less than 1/10 H.P., motor will increase from 50 to 75 R.P.M. maximum and heat rise will tend to be reduced.
3. Choice of 115 or 230 volt models.
4. R51A Motor has 4" shaft extension on each end; ½" shaft diameter. Shaft height is 3". This height may be increased by shimming if necessary.
5. Protected against over-load.
6. Resilient Mounted for quiet operation.
7. Heavy-duty design assures dependable, trouble-free performance.

*1500 R.P.M. Motors also available.
**Available also in ⅓ and ¼ H.P.

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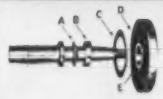
FASCO DISTRIBUTING COMPANY
Augusta Street, Rochester 2, N.Y.

REPLACEMENT VALVE PLATES & SEALS
for
COMMERCIAL, INDUSTRIAL & AUTOMOTIVE REFRIGERATION and AIR CONDITIONING COMPRESSORS
(current & discontinued models)



Long life, high speed, easy-to-apply metal to metal faces. No carbon or other cracking materials.

The only valve plate with replaceable seats.

For the most complete line of replacement valve plates and seals See your Wholesaler, or write for bulletin # 807.

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VALVE PLATE & SEAL
COMPANY
5941 W. FULLERTON AVE.
CHICAGO 39, ILL.

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- **changing territories**
- **expanding your territory**
- **taking on new lines—**

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Your opportunity may be there.

"...flexible modular construction; two bearings, lifetime lubricated; all panels removable; center hub rotors!..." *

* "...and packed with many more facts in a just-printed, 48-page catalogue about what D-H *now* offers you in its popular 30-model central station air conditioning units (horizontal and vertical). Handy time-saver fan performance curves included, too!" Contact direct for Engineering Manual No. CSHV 312, and name of Manufacturer's Agent nearest you. *Send for yours.*

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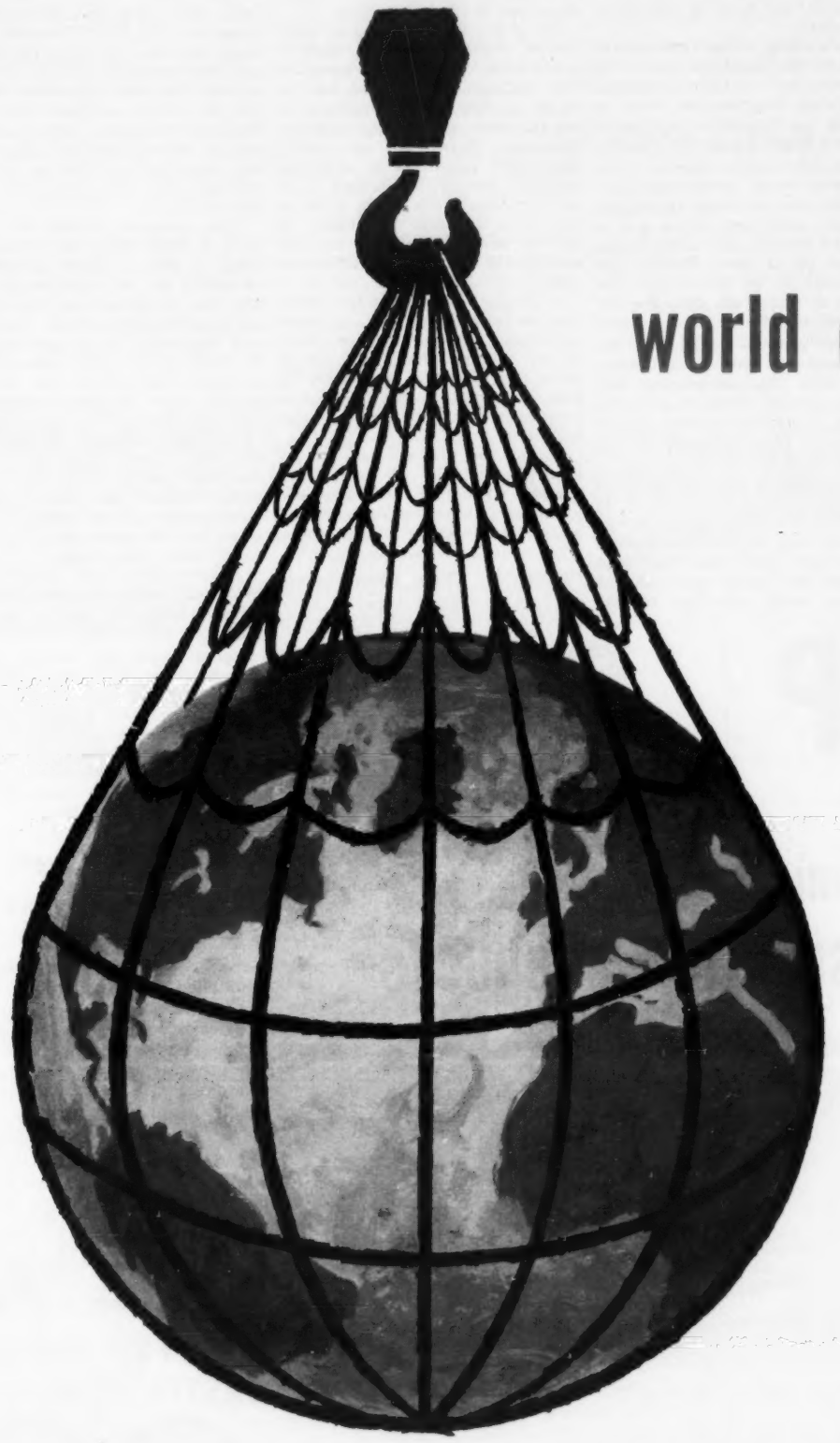

There's a world of business waiting for your company overseas.

Ten years from today the free world's production of goods and services will have doubled.

Ten years from today the free world will have a population of 2,000,000,000.

Ten years from today U. S. exports will be up $8,000,000,000.

Ten years from today foreign sales of U. S. subsidiaries will have doubled to more than $60,000,000,000.

IS YOUR COMPANY TAKING ADVANTAGE OF THIS EXPANSION?

WORLD TRADE ISSUE

By advertising in the World Trade issue of AIR CONDITIONING, HEATING & REFRIGERATION NEWS August 3, you can sell subscribers in 51 nations on your products and your services. Or you can attract new suppliers and distributors to sell your products. The free world is one market . . . let your company grow with it.

NEW YORK, 521 Fifth Ave., MUrray Hill 2-1928-9, Robert M. Price
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AIR CONDITIONING
HEATING & REFRIGERATION
NEWS

The Newspaper of the Industry

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450 WEST FORT STREET • DETROIT 26, MICHIGAN

Refrigeration Problems
And Their Solution
(As Written by Paul Reed)

An Argument about Driers

QUESTION:

To settle an argument, will you please tell me if a drier heating up proves that it is taking water from the refrigerant? There is quite an argument going on here in the shop about it. It sounds reasonable that when the drier takes up water, it would heat up, but it seems to me that I heard or read something about the heat not meaning anything.

ANSWER:

Some years ago this subject was brought to the attention of Dr. W. O. Walker, now Dean of the Division of Research and Industry, University of Miami, but then Director of Research of the Ansul Chemical Co. He ran some very careful tests and found that the heating of the drier was not a reliable indication of whether or not a drier filled with an adsorption type of drying material (silica gel or activated alumina) was removing water from a system.

These two drying materials (or desiccants as they are more properly called) remove water from the refrigerant by "soaking it up." If there is no water in the refrigerant, the desiccant adsorbs the refrigerant itself. However, it "likes" water better than refrigerant, so if some water comes along, it will release some of the refrigerant and take up the water in its place.

In adsorbing either refrigerant or water, the desiccant heats up somewhat, but we have no means of knowing whether the drier is warming up because it is adsorbing refrigerant or adsorbing water.

When the receiver service valve is opened to let refrigerant into the liquid line in which there is a new drier filled with silica gel or activated alumina, the drier begins to warm up at once. Even if the refrigerant is perfectly dry, the drier will warm up, because the desiccant is adsorbing refrigerant.

If there is some moisture in the refrigerant, it will be adsorbed along with the refrigerant, but there is so little moisture, percentagewise, in the refrigerant that it makes very little difference in the heating up of the drier.

Refrigerant-12 that has 40 or 50 parts per million water in it, is rather "wet." Forty p.p.m. is the same as only 4 one thousandths of one per cent, and the heat generated by such a small amount of water being adsorbed by the desiccant is not perceptible.

So, if you are speaking of silica gel or activated alumina, both of which take up water by *adsorption*, the heating of the drier has no value in determining whether or not the drier is removing moisture. Moreover, if you put on a drier filled with silica gel or activated alumina, and the drier first heats up and then cools down, it is no sign that the drier has taken up all the moisture that it can hold and should be replaced with a new one.

It simply means that the desiccant is pretty well "soaked" with refrigerant, with or without water. It will still go ahead and adsorb water, but the heat caused by its adsorption of the water will be so very slight that you won't be able to tell it.

All of the above refers to the adsorption type of desiccants, mainly silica gel and activated alumina, in their various forms, and in some cases, in combination with some other desiccants.

CHEMICAL TYPE DESICCANTS

There is another type of desiccant that removes water by a chemical reaction between the water and the desiccant. The water and the desiccant combine to form another chemical somewhat different from the original desiccant. In some instances, this chemical can be turned back into the original desiccant by heating it and driving out the moisture (reactivated).

This chemical action may produce a little heat, but ordinarily there is such a small percentage of water in the refrigerant that the heat generated by the chemical reaction between the desiccant and the water is not perceptible. If there is a large amount of water in the system, the heating of the drier may be noticeable, but that is unusual.

Calcium sulphate (Drierite) is the best known example of the chemical type of desiccant. It depends mostly on the chemical combination of the calcium sulphate and the water to remove the water from the system.

A drier filled with calcium sulphate (Drierite) will usually heat up very little, but that is no sign that it is not taking up moisture.

Some years ago barium oxide was tried out as a desiccant, and it is quite effective. However, it heats up so much if there is quite a little water in the system, that it becomes quite dangerous. After some accidents with it, it had to be abandoned as a desiccant for driers for ordinary use.

Allis Bulletin Covers Air-Over Fan Motors

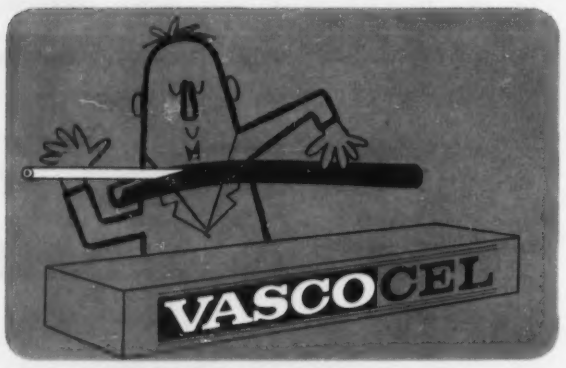
MILWAUKEE — The Louis Allis Co., Milwaukee 1, Wis., has published a four-page bulletin, No. 2950, on its new line of air-over fan motors in ratings of 1 to 125 hp., enclosed and explosion-proof construction.

The motors are designed for operation in ventilating systems, exhaust systems, cooling towers, and all air moving installations where a motor drives a propeller or axial flow fan, it was noted.

SEAL *the cracks* | **STOP** *the drip* | **END** *condensation*

Do it the easy economical way with

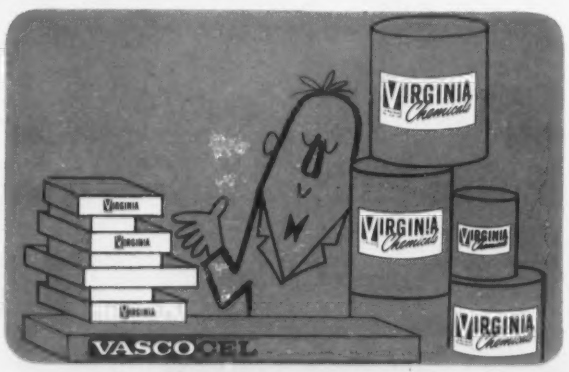
"VIRGINIA" PRESSTITE INSULATION PRODUCTS



VascoCel Tubing & Pipe Insulation—Stops dripping pipes, gives thermal insulation up to 220° F. Is resistant to fire, acids, oil and fungi. Soft, flexible and durable. Slips on easily over tube or pipe. Can be slit lengthwise to fit on pipe which has already been connected.

Permagum Slugs & Cords—Use slugs for tightly sealing all openings—seams, copper tube, BX and conduit entries—against moisture. Protects insulation. Nonshrinking, will not age harden. Cords are ideally shaped for use around display cases, freezers, coolers, etc.

Presstite Insulation Tape—Stops cold pipe dripping, insulates up to 165° F. Tape roll can be carried about conveniently, applied in a jiffy. Sticks to any dry metal surface, never becomes hard or brittle. Just the thing for quick, on-the-spot insulation.



"Virginia" Presstite Insulation Products—One segment of a complete, dependable line of products for the refrigeration industry. Ask your nearest "Virginia" wholesaler about them—or write Refrigeration Division, VIRGINIA SMELTING COMPANY, 101 Jefferson St., West Norfolk, Va.

ESOTOO • V-METH-L • CAN-O-GAS • VASCOCEL • PERMAGUM • PRESSTITE TAPE • SUNISO REFRIGERATION OILS
WATER TREATMENT CHEMICALS • SALES AGENT AND REPACKER FOR DUPONT'S "FREON" REFRIGERANTS

Available in Canada and many other countries

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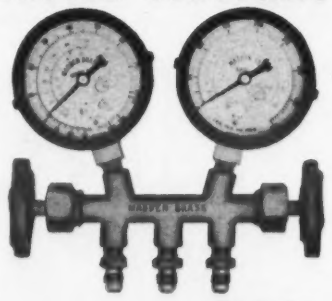
NEW

...FOR EASIER FASTER SERVICING



Pat. Pending

Designed for convenient charging, purging, testing etc., this new compact unit features an all brass forged body, easy-grip hand wheels, Teflon packing and seat for positive shut-off. Equipped with dual scale 2½-inch pressure and compound gauges. Hose connections ¼-inch male flare, gauge connections ⅛-inch female pipe thread.

HANDY HOSE HOLDER

Attaches to back of testing unit so free end of hoses can be conveniently coupled when not in use. Keeps them dry and free from dirt.

SEE YOUR **MADDEN** WHOLESALER

MADDEN BRASS PRODUCTS COMPANY
AURORA 6, ILLINOIS, U.S.A.

Silver Seeks--

(Concluded from Page 1, Col. 2)

expressions of interest from manufacturers," Silver said, "some of them presently in the air conditioning field and some of them thinking of entering it by the purchase of the line we own.

"The young man who engineered the system for Sutton has been attempting to interest some investment capital to take over the line from us and is enthused about its inherent merits.

"Our own thinking is that a logical purchaser of the line would be a currently established air conditioning manufacturer desirous of adding adding to his line a self-contained central unit at a fraction of what it would cost him to tool up and engineer a similar product from scratch."

Silver added that his firm also purchased all the dies for the O. A. Sutton air conditioner and similar lines which were not in current production at the time the plant was shut down.

"These dies," he said, "provide the complete tooling for possibly 10 or 12 different units in the fan and window air conditioner line. Nearly all of them are still in current use and will require servicing for some years to come."

Carrier Survey--

(Concluded from Page 1, Col. 5)

households in the capital district enjoy air conditioning in some form.

"Despite its northerly location, New York State runs Texas a close second in total numbers. The Empire State has more than 400,000 households with air conditioning and ranks second in sales of room units."

Russell Gray, Carrier vice president and general manager of the division responsible for room and central air conditioners for the home, predicts another ¾ million households will have climate control equipment installed during the current year.

He foresees more than 1⅓ million room units being sold at retail in 1959 and about two-thirds of these will go into residences. Another 200,000 homes are expected to incorporate central systems, a new record.

Pointing out that the percentage of air conditioned homes has increased from eight to ten in the past year, Gray estimated this figure will be near 12% in 1959.

According to Carrier, here's the way the top ten states line up in the percentage of households with partial or complete air conditioning:

1.	District of Columbia	36.6%
2.	Texas	21.2%
3.	Louisiana	21.1%
4.	Florida	17.4%
5.	Oklahoma	17.3%
6.	Tennessee	16.5%
7.	Missouri	15.7%
8.	Kansas	14.1%
9.	Nebraska	13.5%
10.	Arizona	13.4%
	National	10.0%

The following states led the nation in sales of room air conditioners in the past year:

1.	Texas	204,400
2.	New York (Including Metropolitan and Upstate New York	124,000
3.	Florida	102,000
4.	Louisiana	79,800
5.	Pennsylvania	74,200
6.	California	65,800
7.	Missouri	63,000
8.	Illinois	61,600
9.	Tennessee	53,200
10.	Georgia	51,800

3 Areas Get Low Electric Heat Rates--

(Concluded from Page 1, Col. 2)

window and central-type heat pump installations, within the price range of a great many Gulf Coast families. Economy of operation for the heat pump is now very close to that of any heating system, regardless of fuel used, the utility claimed.

The lowest step of the normal or summer rate is 1.5 cents per kwh., the same as the low step of the previous rate, which also included demand billing charges for customers creating a demand over 7 KVA.

A new rate for electrically heated homes was put into effect July 1 by the Hartford Electric Light Co.

It calls for a charge of 2.5 cents per kwh. between 7 a.m. and 9 p.m. and 1.25 cents per kwh. between 9 p.m. and 7 a.m.

The minimum charge for night use during the eight coldest months is $10 per kw (name-plate rating) of all heating equipment of any type (excluding water heater), but not less than $100.

According to the utility, energy costs in an electrically heated house will average less than 1.9 per kwh. under the new rate because more power is used during the night than during the day.

To be eligible for the new rate, a home must have a permanently installed heat pump or resistance heating system, an electric storage water heater, and sufficient insulation to give a calculated heat loss of no more than 4 B.t.u.h. per cu. ft. of heated space at a design temperature difference of 70° F.

The insulation requirement can be met with 6 in. of mineral wool insulation or its equivalent in the ceiling, 4 in. in sidewalls, and 2 in. in floors over unheated or occasionally heated areas.

The Detroit Edison Co. (see story, page 6), on June 1, established a 1.94 cent per kwh. residential rate after the first 750 kwh.

Baltimore Aircoil Appoints McDougall

BALTIMORE — Ben M. McDougall has been named field sales manager of Baltimore Aircoil Co., Inc., it was announced by William E. Kahlert, sales vice president.

McDougall

McDougall will spend the major part of his time working closely with the B. A. C. sales office. He is well known in the industry from his former position as general sales manager of Kennard Corp. in St. Louis and his association with ARI and AMCA. He is also a member of ASHRAE.

DRIERS DRIERS DRIERS

Refrigeration Research offers a quality line of driers for every need.....in a complete size range. Refrigeration Research driers contain tested and proven filtering media - filters are designed to prevent plugging up and still do the most effective job. All driers are generously sized for reliability.

Bull Dog *Progressive* Filter-Driers

Your choice - Silica Gel or Molecular Sieve desiccant. Bull Dog Filter-Driers feature progressive filtering.....retain a maximum amount of moisture, dirt and foreign matter without showing increased pressure drop. Low in cost and high in quality.....specify the Bull Dog line - in the drying agent of your choice.

Deluxe Dehydrators

Deluxe dehydrators are ruggedly built with extra large fittings and feature all brass construction. Containing Silica Gel desiccant, the Deluxe series driers are available in a complete size range in either refillable or non-refillable types.

Driers - Receiver Driers - Receivers - Accumulator Driers - Accumulators - Suction Accumulators Manifolds - Heat Exchangers - Strainers - Mufflers

Write for current catalog or contact your wholesaler.

REFRIGERATION RESEARCH
INCORPORATED
9901 E. GRAND RIVER BRIGHTON, MICHIGAN
THE "ORIGINAL EQUIPMENT" PARTS MANUFACTURER SINCE 1944

$297.00

Buys this attractive store cooler and self-contained package unit

2-h.p. 24,700 Btu — 800 C.F.M.
Single phase—Water cooled condenser

Extra's

Plenum and grille as shown	$25.00
Water Valve	10.00
Remote Thermostat	12.00

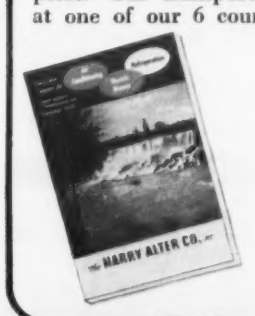
Makes ideal residential unit too, especially where customer has hot water or gravity furnace, or undersized blower on present furnace.

Quantity Limited — Terms: Cash with order

HEATING AND COOLING, INC.
128 NORTH ROCK ISLAND
AM-5-3881 WICHITA 2, KANS.

WE EXPAND YOUR DOLLARS MIGHTILY

Sure, everybody likes to make a buck go farther. At the Harry Alter Co. we think our prices are *always low.* And everybody big or small, city or country, pays the same fair price. Our transportation allowance saves you even more money. (And if you pick up at one of our 6 counters, you still get this allowance.)



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SUPPLIES and PARTS

SAVE MONEY, time and effort by ordering from our new *Dependabook,* the most complete catalog of all. 232 pages. Over 10,000 items carried in stock. *Wholesale only.* Your orders filled really fast by mail, or they can be picked up at one of our six big warehouses.

Write on your letterhead for the 1959 DEPENDABOOK...
Also our monthly Flyer of surplus and close-out Bargains.

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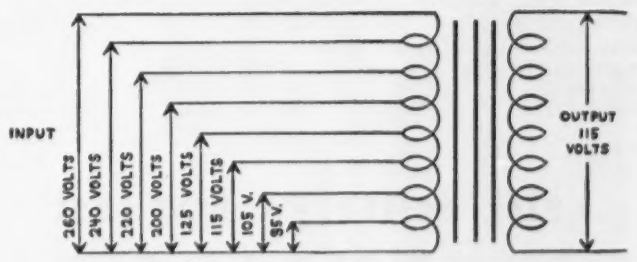
FREE PARKING AND FAST COUNTER SERVICE AT THESE 4 BIG WAREHOUSES

WHAT YOU SHOULD KNOW ABOUT TAPPED WINDING TRANSFORMERS



• Tapped winding transformers, solve both sales and installation problems, inexpensively. For example; where an air conditioner, refrigerator, or other appliance, powered by a 115 volt motor is to be installed in a location where only 230 volt power circuit is available, a tapped winding transformer plugs into the power circuit and supplies 115 volt service to the appliance.

Or, as another example; where the appliance installation is made in a location where supply voltage is *below* the normal required for good motor performance (105 volts or lower) then the input line connected to the proper taps can improve the low voltage condition and provide 115 volt service.

As shown in the diagram this transformer is designed with taps for 260/240/220/200/125/115/105/95 volts primary connection and when connected to the proper primary taps will provide a 115 volt source of supply.

Available in ratings of 350, 550 and 750 VA. Other models provide 230 volt output from 208 volt available circuits. Write for Bulletin TW-320.

ACME ELECTRIC CORPORATION
927 WATER STREET CUBA, NEW YORK

Acme ACME Electric
TRANSFORMERS

Plant Vacation Schedule

Shutdowns Starting

July 31 or Earlier

This is the third in a series of handy guides to summer vacation or inventory shutdown schedules announced by manufacturers. It is published to help salesmen avoid useless calls and to assure purchasing departments of adequate stock on hand. This list will not be repeated. CLIP and SAVE for future use.

Company	Shutdown Period Plant	Office	Shipments From Plant
Ace Pump Corp.	7/31-8/17	Open	Regular
Automatic Switch Co.	7/11-7/26	Open	Emergency, Stock Items
Barnebey-Cheney	7/11-7/26	7/11-7/26	None
Chase Brass & Copper Co. Waterbury Mill & Forgings Div.	7/20-8/2	Open	Stock Only
Dole Refrigerating Co.	7/24-8/3	7/24-8/3	Emergency
Dunham-Bush, Inc. Michigan City, Ind. Plant	7/18-8/2		Emergency
Eaton Mfg. Co., Heater Div.	7/24-8/10		Emergency, Stock Only
Fogel Refrigerator Co.	7/25-8/9		Emergency
Geauga Industries Co.	7/27-8/9	Open	None
General Electric Co. Small Integral Motor Dept. General Purpose Motors	7/27-8/7	7/27-8/7	Emergency, Stock Only
Hermetic Motor Parts	7/20-8/7	7/20-8/7	Emergency, Stock Only
Handy & Harman	7/11-7/26		
Imperial Brass Mfg. Co.	7/27-7/31	7/27-7/31	Emergency, Stock Only
Jewett Refrigerator Co., Inc.	7/11-7/25	7/11-7/25	Emergency
Johnson Service Co.	7/27-7/31		Regular
Libbey-Owens-Ford Glass Co. Thermopane Plant	7/20-8/2		Emergency To 7/25 Only
Marsh Corp.	7/17-8/2	7/17-8/2	Stock Only
Penn Controls, Inc.	7/20-8/2	7/20-8/2	Emergency Stock Only
Powers Regulator Co.	7/20-7/31	Open	Stock Only
Resistoflex Corp.	7/27-8/7	7/27-8/7	None
Reveo, Inc.	7/26-8/9	7/26-8/9	Regular
Revere Copper & Brass Inc. Detroit Plant	7/20-8/2	Open	Regular
Rudy Mfg. Co.	7/24-8/9	7/24-8/9	Scheduled
Schaefer, Inc., Aberdeen Plant	7/25-8/2	Open	Regular
Sub-Zero Freezer Co., Inc.	7/6 -7/17	Open	Regular
Tenney Engineering, Inc.	7/20-7/26	7/20-7/26	Emergency
Traulsen & Co., Inc.	7/27-8/9		None
Tuthill Pump Co.	7/20-8/2	7/27-8/2	Emergency
Westinghouse Electric Corp. Springfield Works	7/18-8/2	7/18-8/2	Stock Only
Wilcolator Co.	7/17-8/2	7/17-8/2	None
Wiremold Co.	7/31-8/16	Open	Emergency

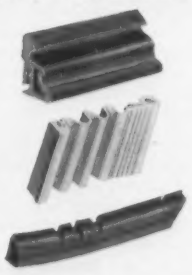
quick delivery...low cost

EXTRUSIONS

TUBING...GASKETS...SEALS

Single or multi-webb forms for moisture, air and water seals... spliced-to-fit or straight... in various lengths.

Your choice of natural rubber, synthetics, vinyls matched to your color or in new metallics.



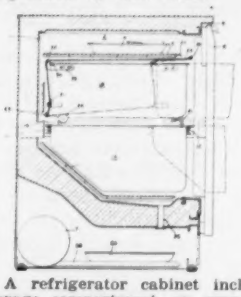
Investigate GI's Hypalon double-extruded appliance tubing; extra-resistant to oxidation and chemical deterioration.

GICO GEAUGA INDUSTRIES, INC. MIDDLEFIELD, OHIO

PATENTS

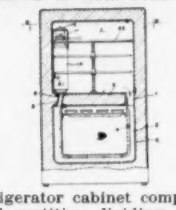
Week of Mar. 10 (Continued)

2,876,632. REFRIGERATOR CABINET HAVING DRAWER BAFFLE MEANS. Ralph E. King, Louisville, Ky., assignor to General Electric Co., a corporation of New York.



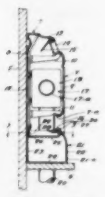
1. A refrigerator cabinet including a storage compartment, an evaporator positioned in said compartment, a drawer slidably supported below said evaporator and a flexible baffle between said evaporator and drawer for shielding the contents of said drawer from ice and water falling from said evaporator and means carried by said drawer for causing said baffle to flex progressively downwardly behind said drawer when said drawer is opened.

2,876,633. REFRIGERATOR WATER COOLER. Ralph E. King, Louisville, Ky., assignor to General Electric Co., a corporation of New York.



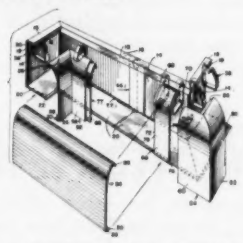
A refrigerator cabinet comprising an insulated partition dividing said cabinet into an upper food storage compartment and a lower freezer compartment, said partition forming the top wall of said freezer compartment, an evaporator forming the side and bottom walls of said freezer compartment, means for circulating air from said food storage compartment over said evaporator and back into said food storage compartment comprising walls defining an air passage around said evaporator outside said freezer compartment and having an inlet extending through said partition and communicating with said food storage compartment adjacent one side wall of said food storage compartment and an outlet extending through said partition adjacent a second side wall of said food storage compartment, a duct in said food storage compartment connected to and extending upwardly from said passageway outlet along said second sidewall and terminating adjacent the top of said food storage compartment, a fan mounted on the upper end of said duct for effecting circulation of air from said food storage compartment over said evaporator and back into said food storage compartment, and a tubular jacket surrounding said duct within said food storage compartment and forming with said duct a fluid reservoir in said food storage compartment for the storage and cooling of water by the cooled air circulating through said duct.

2,876,690. HEATING, COOLING AND VENTILATING SYSTEM. Joseph D. Pierce, West Hartford, Conn., assignor to The Vulcan Radiator Co., Hartford, Conn.



1. In a heating and ventilating system for a building, a unit including an enclosure having inlet and outlet openings, a heat-exchanger between said openings, a fresh air duct communicating with the exterior of the building and having a front wall with an upper edge running along the bottom of the inlet opening, means for forcing air through said duct, and a series of jets disposed along said upper edge of the front wall and angled upwardly and inwardly for directing air from said duct past the inlet opening into said enclosure and over the heat-exchanger and through the outlet opening.

2,876,691. BASEBOARD AIR DUCT ASSEMBLY. Marquis A. Woods, Franklin Park, Ill.



1. A baseboard duct assembly comprising a rear section having an inverted channel formation at its upper marginal edge extending the length of the section on the forward side thereof, a front section having a rearwardly and downwardly extending flange along its upper marginal edge adapted to be disposed in parallel spaced relation withh the channel formation on said back section to define a venting slot therebetween, and a spring clip for securing the upper edge of said front section in said spaced relation with said back section. . . .

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POSITIONS WANTED

ATTENTION MANUFACTURERS: District manager: Interested in genuine opportunity with manufacturer to cover the Philadelphia area. 36 years old, nine years' experience in sales & application of packaged & remote type air conditioning, refrigeration & heating. Experienced in contacting: architects, engineers, wholesalers, contractors. Proven sales record. BOX A6284, Air Conditioning, Heating & Refrigeration News.

20 YEAR experience in the refrigeration wholesale trade calling on refrigeration dealers, and contractors also ice cream manufacturers, have very good following am very well known can supply good references. Interested in representing good firm, will relocate. Have contacts in New England. BOX A6296, Air Conditioning, Heating & Refrigeration News.

REFRIGERATION SERVICEMAN with five years' experience in commercial refrigeration and air conditioning and some servicing of bulk milk coolers desires position with expanding company. Willing to relocate—preferably in Midwest. BOX A6297, Air Conditioning, Heating & Refrigeration News.

POSITIONS AVAILABLE

SALES ENGINEERS qualified in engineered machinery refrigeration and air conditioning sales, who want to work and who want incentive and a future commensurate with their efforts, contact Walter L. Pharo, Vice President and General Manager, CANADIAN ICE MACHINE COMPANY, 65 Villiers Street, Toronto, Canada, manufacturers and distributors of York products throughout Canada for over 47 years.

PUBLISHER'S REPRESENTATIVE—Sell R.A.C. Pricing Service to contractors and wholesalers. Experience in pricing of parts and supplies. Trade association experience helpful. Exclusive territories set up depending on your qualifications. Can be carried as side line. Base plus commission. Write RAC PRICE REPORTER, 2812 So. Robertson Blvd., Los Angeles, California.

IMMEDIATE OPENING for experienced servicemen, commercial refrigeration & air conditioning, service & installation, some heating desirable. Advancement & good future for capable men with expanding company in Los Angeles area. Send resume including present earnings to: SOUTHLAND REFRIGERATION & AIR CONDITIONING COMPANY, 515 West Mission Road, Alhambra, California.

ENGINEER, WANTED to teach heating, refrigeration and air conditioning theory and to direct department activities. Working and living conditions excellent. All fringe benefits. Salary $6500 to $8000 depending on background. Write George S. Whitney; STATE UNIVERSITY OF NEW YORK, Alfred, New York.

SALES REPRESENTATIVES wanted for leading California manufacturer and distributor of refrigeration equipment. Now embarking on a wide scale sales program featuring exclusive line of ice making equipment, soda flaker combinations and vendors. Program aimed at all consumer users of ice refrigeration. Supported by an intensive merchandising and advertising campaign. Opportunities unlimited. Write BOX 3035, El Monte, California.

ENGINEER REFRIGERATION Controls—To head a department on design and development of commercial refrigeration control valves of all types; national corporation with midwestern manufacturing and engineering facility; salary and bonus commensurate with work background and ability. Send full details, qualifications and personal data to BOX A6172, Air Conditioning, Heating & Refrigeration News.

EQUIPMENT FOR SALE

PRICE LIST R-94, discount 45% f.o.b. Washington C. H., Ohio, list prices for enclosed meat cases 6' $750.00, 8' $960.00, 10' $1180.00. Enclosed vegetable cases 6' $798.00, 8' $944.00) 10' $1090.00. Send for complete catalog. THE COFFMAN STAIR CO.—Refrigeration Div. (Formerly Morton Show Cases, Inc.) Washington C. H., Ohio. Phone 5-7861.

CLOSEOUT ON last year's model of central air cooled units. Distributor will sacrifice entire lot of 2 10-ton, 2 7½-ton, 16 3-ton, and 7 5-ton complete condensing units for $12,500.00 delivered. Reply to BOX A6290, Air Conditioning, Heating & Refrigeration News.

BUSINESS OPPORTUNITIES

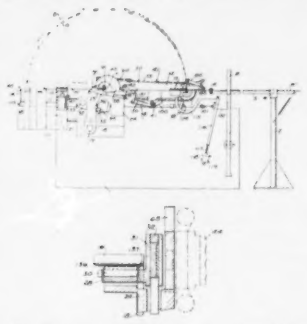
WANTED: HEATING and cooling accessories. We are interested in new fabricated metal products to manufacture and sell to manufacturers and wholesalers of furnaces and air conditioners. Bob Main, VIKING AIR PRODUCTS, 5601 Walworth Avenue, Cleveland 2, Ohio.

MISCELLANEOUS

CONTROLS, RELAYS & timers repaired. UNITED CONTROL REPAIR COMPANY. New address: 151 E. 126th St., New York 35, New York.

ATTENTION REFRIGERATION Servicemen: Would you be interested in saving from 25 to 50% on many standard refrigeration and air conditioning parts and supplies? Send for our free circulars and catalogs. WALTER W. STARR, 2833 Lincoln Ave., Chicago 13, Illinois.

2,876,823. BENDING PAD STRUCTURE AND ASSOCIATED APPARATUS FOR BENDING TUBE. David R. Knox, Huntington Woods, and Stanley Gondek, Detroit, Mich., assignors to Bundy Tubing Co.



1. In an apparatus for bending a plurality of work pieces of elongated form, such as tubes, a bending form with smooth forming surfaces, a bending pad, a bending form and the bending pad adapted to have a plurality of work pieces disposed therebetween, the bending pad having a plurality of grooves therein, one for each work piece, and adapted to engage the work pieces with a work piece in each groove, the grooves being formed to fit the individual work pieces. . . .

(To Be Continued)

Servicing Automobile Air Conditioners

(Vol. 4 — 1959 Models)

BY C. DALE MERICLE

With this issue we continue the fourth series of articles describing service procedures on automobile air conditioning units. In these instalments 1959 models of the leading "independents" and automobile manufacturers are being described in detail.

As with the previous series, these articles are intended for the refrigeration serviceman who has a good grounding in fundamentals backed with practical experience.

Previous articles covering earlier models of many makes of units are available from the NEWS in manual form as Vols. 1, 2, and 3 of "Servicing Automobile Air Conditioners." Vol. 3 being devoted to 1958 models.

CADILLAC (1)

Cadillac Motor Car Div.
General Motors Corp.
Detroit 32, Mich.

Basic refrigeration system of the 1959 Cadillac air conditioner is essentially the same as the 1958 model. Vacuum operated power units or diaphragms, however, are provided in the 1959 system to regulate proportion of outside to recirculated air, and for the larger 67 series cars there is a second evaporator assembly installed in the trunk.

Standard 1959 Cadillac system (Fig. 1) has the condenser located in front of the car radiator, the compressor mounted on the engine and driven through a magnetic clutch, and the evaporator and blower mounted on the engine compartment side of the dash panel.

Temperature control is achieved by a manually regulated hot gas by-pass valve.

Refrigerant-12 is employed in the Cadillac air conditioner. Full charge is 4½ lbs.

Compressor

The Frigidaire 5-cylinder axial compressor driven through a magnetic clutch is used on the 1959 Cadillac system. It is mounted on the right side of the engine.

Service valves are mounted on the rear of the compressor.

Frigidaire 525 viscosity oil is used in this compressor. Full charge is 13 fl. oz. in Series 60, 62, 63, and 64 cars; 16 fl. oz. in Series 67 and 68 cars.

Condenser

Condenser is installed in front of the car radiator.

On the right side of the condenser is the combination dehydrator-receiver.

Sight glass is on top of the dehydrator-receiver and is an integral part of it.

Evaporator

Evaporator is housed in a plastic case mounted on the engine compartment side of the dash panel at the extreme right.

Thermostatic expansion valve, which is non-adjustable, is located outside the evaporator case.

Blower assembly is mounted in the engine compartment to the left of the evaporator in its own housing, which also includes two air valves or dampers and three vacuum power units for regulating proportion of outside air to recirculated air. Blower, which is also used for heating, has a four-speed control selector.

Outside air is admitted to the system through a vent in the cowl in front of the windshield.

Conditioned air is delivered to the car interior through three outlets on the instrument panel, one in the middle and one on each side.

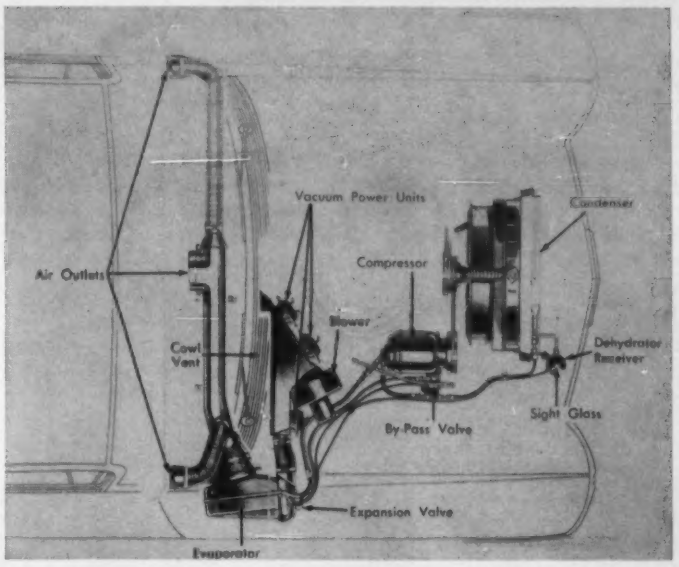


FIG. 1—General layout of 1959 Cadillac air conditioner. On 67 series cars there is also a second evaporator in trunk beneath parcel shelf.

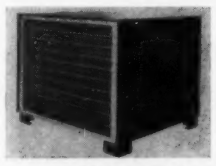
On 67 series cars, in addition to the above there is a second evaporator installed in the trunk beneath the parcel shelf. This is equipped with a blower on each side, both of which are controlled by a three-speed switch mounted on the right rear armrest.

(To Be Continued)

Cash in with

Comfort-Aire

AIR CONDITIONING



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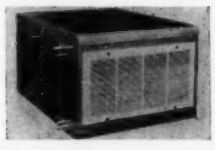

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U.S. PAT. NO. 2,451,701 & ADD. PAT. PEND.

PART NO. T-300B

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Watsco features their all-new DERCO Seal which has a bakelite body and is short enough to allow the terminal cover to be replaced. Each seal has its own electrical connector. A special nut remover, to remove frozen or rusted nuts from the terminal post is included in each set, at no additional cost. The DERCO seal is designed to fit almost every make unit. Distributed by Watsco, Inc.

For complete information send for catalog #21. Write to Dept. N-7

"ANNOUNCEMENT TO THE TRADE"
Please take notice that infringers of Patent No. 2,451,701, covering our terminal replacement for sealed refrigeration units, will be prosecuted to the fullest extent permitted by law. This announcement is addressed not only to manufacturers of infringing terminal replacements, but also to those who sell, distribute or use them. (Signed) WATSCO, INC.

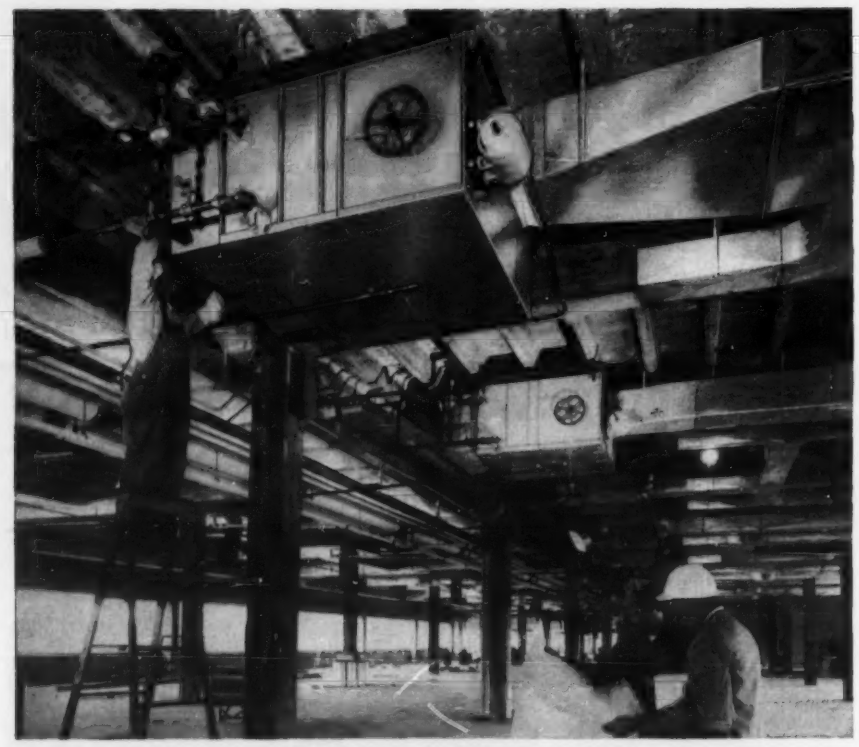
WATSCO INC.

1020 E. 15th STREET • HIALEAH, FLORIDA

At IBM —the Comfort Computation came out . . .

Contractor: Roland Thompkins & Son, Inc. Hawthorne, N.Y.
Consulting Engineer: Giffels & Vallet, Inc. Detroit, Mich.
Architect: L. Rossetti Detroit, Mich.

DUNHAM-BUSH



The Dunham-Bush 'HAH' is designed for ceiling installation which conserves space vitally needed for engineering purposes.

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Contact your nearest Dunham-Bush sales representative for assistance when your next heating or cooling job arises.

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Close-up of Dunham-Bush 'HAH' which cools, heats, filters, dehumidifies air.

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